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THE UNIVERSITY OF ALBERTA

RISK AND RETURN ANALYSIS OF BEEF FEEDLOT INVESTMENTS IN ALBERTA

by

HEATH COLES ©

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

IN

AGRICULTURAL ECONOMICS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled **RISK AND RETURN ANALYSIS OF BEEF FEEDLOT INVESTMENTS IN ALBERTA** submitted by Heath Coles in partial fulfilment of the requirements for the degree of **MASTER OF SCIENCE** in Agricultural Economics.

Leonard Bauer
Supervisor

....

Gu Mathison

Date June 6 1989

Dedication

This thesis is dedicated to Mom and Dad. My life growing up on the farm with their love and guidance is my greatest asset and my most precious memory. It will always be home.

Abstract

The objectives of this study were to identify sources of risk facing an investor in beef feeder cattle, measure the returns and risk associated with this investment, and calculate a beta coefficient which can be used to evaluate investment opportunities in beef feedlots.

The investor was assumed to purchase 100 head of cattle each month and place them on feed in a commercial feedlot for a finishing period of approximately 90 days. The returns on each lot of 100 head was calculated and compared to predicted returns based upon prices predicted from the futures market data available at the time when the decision would have been made. This series of returns over the 156 month period was found to have a mean real annualized return of 6.32% with a root mean square error of 41.1%. Comparisons to stock market performance as revealed by the TSE 300 over the same period of time resulted in a beta value of 0.64.

An alternative strategy was developed under which the investor would invest in cattle when predicted cattle returns exceeded predicted 90 day treasury bill returns and invest in treasury bills otherwise. In this case a real annual return of 9.0% was realized with a mean square error of 34.2% and a beta value of 0.40.

Further analysis indicated that most of the risk identified in the model was attributable to market price risk. The removal of all other sources of variation did not reduce the level of risk and a breakdown of the components of MSE indicated that almost all of the MSE is caused by errors in predicting revenue.

Tests for time trends in net returns and in prediction errors for net returns indicated that at a 95% level of confidence there was no evidence of time trends in returns but there was a trend in the error terms.

Tests for autocorrelation in net returns and in prediction errors for net returns indicated that at a 95% confidence level autocorrelation was found in net returns but did not occur in the error terms.

Acknowledgements

The successful completion of this degree was due in no small way to the help and friendship of many people. To each of you I wish to express my sincere thanks:

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I. INTRODUCTION

A. BACKGROUND

The beef industry has always been a major part of the agricultural economy in Alberta. Statistics for 1986[1] showed that cattle and calves accounted for 29.3% of the total farm cash receipts with a dollar value of $1,106,000,000. Wheat was the second highest with 13.7% of the total. Statistics also show that in 1986 there were 1,004,307 steers and heifers of Alberta origin slaughtered and as of July 1, 1986 there were 681,000 steers and heifers being fed for slaughter on Alberta farms.

A large number of these cattle are finished and marketed through commercial feedlots. With the large number of calves (1,067,000 in 1986) being produced in the province and with the development of custom feedlots which allow for "hands-off" involvement in the industry it would seem that an opportunity exists for off-farm investors to invest money into the industry if it compares favorably to other investments and if it fits well into a portfolio of investments.

Investment choices can be studied on the basis of two criteria; rate of return and variability of return or risk. Measuring rates of return, given data on the revenue and costs of an investment is straightforward. If all other factors are constant then choosing an investment is merely a matter of finding the most profitable one or in other words, the investment with the highest rate of return.

Unfortunately, this method of investment choice is highly simplistic and likely to produce disappointments when applied to real life conditions. In reality there is risk involved with each investment and an investor must make decisions as to the level of risk that he wishes to endure. Once this risk level is determined the investor must then choose the investment or portfolio of investments which will provide the highest rate of return and the investor must be able to evaluate the effect of an investment on his portfolio.

The measurement of risk first requires an understanding of the types and sources of risk which an investor faces. In the context of a beef feedlot investment there is both production and price risk to consider and the challenge is to develop a model which accurately incorporates and measures the risk which these factors contribute to the investment.

---

[1] See Alberta Agriculture Statistics, 1987.

B. OBJECTIVES

The objectives of this thesis are threefold. The first objective is to identify sources of risk facing an investor in beef feeder cattle.

The second objective is to measure realized net returns and to measure the variation in these realized returns from predictions.

The third objective is to evaluate beef feedlot investment opportunities and relate them to alternative investments.

C. OUTLINE OF THESIS

The remainder of this thesis is structured in the following manner.

Chapter 2 is a review of literature and gives background on other work that has been done on this topic as well as a review of background theory.

Chapter 3 provides a detailed breakdown and description of the model being used and discusses the assumptions and limitations which must be considered in doing this study.

Chapter 4 analyzes the data obtained from the model and provides a discussion of these results.

Chapter 5 lists the conclusions which are drawn from the study and also provides a short discussion of areas which may require further research.

II. LITERATURE REVIEW

A. INVESTOR THEORY

Utility and consumer theory provides a framework which makes possible the assumption of rational behaviour of a consumer in the marketplace. An investment decision, which is a decision to delay consumption over time, is one aspect of consumption theory and thus is covered by the same axioms of consumer behaviour as other consumption decisions.[2]

The returns which accrue from an investment decision reflect two things. One is the time value of money which is the portion of returns equal to that of a riskless asset. The second is the risk premium associated with delaying consumption.[3] Rational investors, while being interested in higher returns, are also considered to be risk averse. The level of risk premium associated with an investment is determined not by an individual's utility function but by the utility functions of all investors in the marketplace. Individual investors make investment choices based on the amount of risk involved and the risk premium being offered. Once a desirable level of risk is determined, a rational investor will always choose the investment at that risk level which offers the highest risk premium.

Therefore it is necessary to be able to measure risk and returns in evaluating investment alternatives.

B. MEASUREMENT OF RETURNS

A definition of net returns is given by the equation:

$$r = \Gamma - \Theta \qquad (1)$$

where: r is the net dollar returns per period

Γ is the cash inflow per period

Θ is the cash outflow per period.

---

[2] Consult Varian (1978), Green (1976), Henderson and Quandt (1971), and Gravelle and Rees (1981) for a discussion on these axioms.

[3] See Brealey et al (1986).

These returns are calculated for each time period being studied and can be refined to express returns in percentage terms as the internal rate of return whereby:

$$X_j = \frac{r_j}{\theta_j} = \frac{(\Gamma_j - \theta_j)}{\theta_j} \qquad (2)$$

where: X_j is the rate of returns

j is the time period.

Mean values for returns are calculated as follows using the returns for individual time periods:

$$\overline{X} = \frac{1}{n}\sum_{j=1}^{n} X_j \qquad (3)$$

where: $\overline{X}$ is the mean return

n is the number of time periods.

C. MEASUREMENT OF RISK

Risk measurement involves measuring the variation in returns. It compares observed values of a parameter with either the mean or predicted values of a parameter and calculates the variation. Variance measures the dispersion of estimates about their mean value. It is measured as:

$$VAR = \frac{1}{(n-1)}\sum_{j=1}^{n} (X_j - \overline{X})^2 \qquad (4)$$

where: X_j is the observed value

$\overline{X}$ is the mean of the observed values

$(n-1)$ is the number of observations.

The term $(n-1)$ is used rather than n because it is a sample of a population rather than the population itself. This measure assumes that the investor has no prior knowledge of future events. It can thus be considered to be a naive or simple measure of risk because the predictable portion of this variation is assumed to be zero and hence it overstates risk.

This equation can be broken down into its random and predictable components as follows:

$$(X_j - \overline{X})^2 = [(X_j - \hat{X}_j) + (\hat{X}_j - \overline{X})]^2 \qquad (5)$$

where: $(X_j - \overline{X})^2$ is the total risk

$(X_j - \hat{X}_j)$ is the random portion

$(\hat{X}_j - \overline{X})$ is the predictable portion

$\hat{X}_j$ is the predicted value of the outcome.

Often there will be information available to the investor which may allow him to anticipate some of the variation which will accrue to an outcome. In cases such as this the predictable portion of variance is not zero and can be excluded from the risk measurement by using a predicted value for the outcome. Thus a situation arises where it is more appropriate to use a method of risk measurement which includes only the random portion of variance.

Mean square error (MSE) measures dispersion of results from the predicted value of the parameter. It is defined as:

$$MSE = \frac{1}{(n-1)}\sum_{j=1}^{n}(X_j - \hat{X}_j)^2 \qquad (6)$$

D. BASIS RISK

The model designed for this project uses futures contract prices to determine predictions of slaughter prices for cattle. The risk arising from the use of futures contract prices comes from two sources: risk in the futures market itself and a second source of risk called basis risk.

Basis is defined as the difference between the futures contract price and the present cash price. For storable commodities such as grain the present cash price and futures price are related because the same expectations are used in determining both prices and basis is said to be a market determined value (Leuthold 1979).

Non-storable commodities such as beef cattle do not have a market determined basis but rather it is a residual between the present cash price and the futures price. The two prices are considered to be independent with cash prices being a function of current supply and demand conditions and futures prices being a function of expected supply and demand (Leuthold 1977, 1979).

The difference between basis risk and risk in the futures market can be explained in the following manner.

If an investor is in period t and wishes to predict the slaughter price in period (t+3) then one method is to look at the price in period t of a futures contract deliverable at period (t+3). The mean basis is the mean historical difference between prices at period t of futures contracts deliverable at period (t+3) and slaughter cash prices at period (t+3). Calculating the mean basis and subtracting it from the futures contract price provides an estimate of the cash price prediction for period (t+3).

The variation which may eventually occur between the predicted cash price and the realized cash price comes first of all from variation in the realized price from the futures contract price, and secondly from variation in the realized basis from the mean basis.

A numerical example illustrates these two sources of variation. In order to simplify the example the exchange rate from Canadian to U.S. dollars is assumed to be constant.

If it is assumed that the futures contract price in period t for period (t+3) is $81 U.S. and the predicted exchange rate for period (t+3) is $.90 U.S. then the futures contract price is $90 Can. If it is also assumed that the mean historical basis is $7 Can. then the predicted slaughter price for period (t+3) is $90 - $7 = $83.

When period (t+3) arrives the realized price is found to be $79 which indicates that there was a total variation of $4. This variation can be broken down into its components in the following manner.

It is necessary to observe the (t+3) period futures contract price early in period (t+3). If it is assumed to be $78 U.S. then it will be $86.67 Can.

The change in the futures contract is calculated to be $90 - $86.67 = $3.33.

The basis at the time of delivery is $86.67 - $79 = $7.67.

The change in the basis is $7.67 - $7 = $0.67.

From this the total variation can be calculated from its components as $3.33 + $0.67 = $4.

This research does not attempt to measure the amount of basis risk. However, it should be recognized that basis variability is a potential source of risk in the total risk of a feedlot investment. Literature on basis risk would suggest that it is present and is a significant part of the total variation in price.

Price et al (1979) did a study on basis variability where nearby basis is considered. They define nearby basis as the basis of the last eight weeks of a futures contract. They further divide basis by defining the delivery period as the period from zero to three weeks prior to delivery and the non-delivery period as being from four to eight weeks prior to delivery.

They concluded from their study that yearly variation existed in the basis and that there was variation with regard to delivery month. They found that variability of the basis was much narrower in the delivery period than in the non-delivery period and that location was not a source of difference in variability.

Vollink and Raikes (1977) determined that basis values for live cattle vary considerably during the delivery period. They felt that sources of basis variation were due to price expectations of speculators (40%) as well as the risk associated with delivery and arbitrage.

Garcia et al (1984) also looked at measuring basis for livestock markets. They did not assume that all basis is random and risky but rather that there is a systematic and non-systematic component. In this case they wanted to measure the non-systematic component. They stated that the variation in basis can vary over the contract life as new information becomes available due to several reasons:

1. arrival of new information is uncertain and unpredictable
2. similar information may have different effects depending on when it is received
3. as maturity approaches cash and futures prices are more closely tied and forecasts may also be more accurate
4. market location may affect the level of risk.

Their results suggest that there is significant variability in the random basis component and that there was not much evidence of lower levels of basis risk as contract maturity approached. They also found little difference in risk at different locations.

Overall, it would appear that basis risk exists and plays a significant role in the risk involved with estimating livestock returns.

E. RISK-RETURN TRADE-OFFS

As the returns on an investment increase the risk level increases as well. This means that the objectives of maximizing returns and minimizing risk are conflicting ones and some type of trade-off between the two must be made. In order to do this the investor must be able to analyse the types and effects of risk in an investment portfolio.

The theory of risk-return trade-off can be traced to Markowitz (1952) and the development of expected return-variance of return (EV) relationships and the theory that risk has two parts: unique or nonsystematic risk which is diversifiable and market or systematic risk which is non-diversifiable.[4]

An investor who can and wishes to diversify needs to be interested only in systematic risk and how a particular investment will affect the systematic risk in the portfolio.

---

[4] For further reference on this see Markowitz (1952) or Brealey et al (1986), Pp. 135-136

F. BETA COEFFICIENT

Measuring the sensitivity of returns of an individual investment to market movements involves the measurement of what is known as a beta coefficient. The beta for a particular investment, X, is measured by:

$$\beta_x = \frac{COV(X.Y)}{\sigma_y^2} \tag{7}$$

where: β_x is the beta value for X

$COV(X.Y)$ is the covariance between returns to investment X and the market portfolio Y

σ_y^2 is the variance in the market portfolio.

With a well diversified portfolio which has eliminated all nonsystematic risk, a one percent shift in the market returns means a one percent shift in the portfolio returns and thus the portfolio has a beta value of one. An investment with a beta value equal to one is therefore assumed to have on average the same systematic volatility as a well diversified portfolio. A beta greater than one means that the investment exhibits more volatility than the market portfolio and will increase systematic risk when added to the portfolio. The opposite effect occurs with a beta value less than one.[5]

Because a portfolio investor is only interested in non-diversifiable risk, any risk premium on an investment will be related solely to systematic risk and the beta of that investment.

A riskless investment which does not contribute any additional risk to a portfolio will have no risk premium and a beta of zero while an investment which contributes the same amount of risk to a market portfolio as the portfolio already exhibits will have a beta of one and a risk premium equal to that of the market portfolio.

Since most investments are neither riskless nor do they exhibit characteristics the same as a market portfolio it becomes necessary to estimate beta values and/or risk premiums.

G. CAPITAL ASSET PRICING MODEL

Models for estimating the effects of systematic risk and calculating the risk premiums on an investment have been derived from the theoretical foundation outlined above and are used in risk analysis of investment opportunities and their effect on a market portfolio.

---

[5] See Brealey et al (1986), p. 158 and Collins and Barry (1986), p. 153

Markowitz (1959), Lintner (1965), and Sharpe (1963, 1964) developed the Capital Asset Pricing Model which, stated simply, says that in a competitive market the expected risk premium varies in direct proportion to beta[6]. CAPM is one of the most widely known and used methods of measuring beta coefficients. Its general form gives the following relationship:

$$r_r = r_f + \beta(r_m - r_f) \qquad (8)$$

where: r_r is the required rate of return in equilibrium

r_f is the risk-free rate of return

β is the beta value.

II. PREVIOUS WORK

There has been limited work done in the farm sector on measuring beta coefficients for agricultural commodities and assets. Most of the work that has been done has centered around the use of CAPM or the Single Index Portfolio Model as developed by Sharpe (1963, 1970).

The Single Index model provides a measure of risk for individual assets or enterprises that accounts for the combined effect of the asset's own variance as well as covariance with other assets. Unlike CAPM it does not require equilibrium in the market.

Collins and Barry (1986) used a Single Index approach to estimate beta coefficients for various cropping activities. These coefficients are for individual crops relative to the farm portfolio and are calculated based on variation in deflated net returns.

Turvey and Driver (1987) use a different approach in estimating beta coefficients for various agricultural commodities. They develop a Farm Sector CAPM which measures the beta coefficients relative to a farm portfolio. They note that equilibrium conditions exist within the farm sector for their model due to the method in which they construct their farm portfolio and therefore is consistent with CAPM theory. Their empirical results are based on measurement of returns using gross revenues which are not deflated.

Barry (1980) uses the CAPM approach to measure beta values and risk premiums for farm real estate by regressing a time series of excess returns, which are defined as being the returns above those received on a riskless asset, for individual assets against a time series of excess returns for a market portfolio:

---

[6] CAPM was developed by Sharpe (1964), Lintner (1965), and Jack Treynor in an unpublished article.

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} \qquad (9)$$

where: R_{it} is the excess rate of return on investment i

R_{mt} is the excess rate of return on the market portfolio

β_i is the beta value for investment i

e_{it} is the error term

The anticipated value for α_i is zero.

Mercier (1988) estimated beta coefficients for investments in Alberta farmland using CAPM and compared them to a market index.

A study done by Brown (1989) estimated mean annual returns and standard deviations for various cropping and livestock activities in Saskatchewan for the period from 1971 to 1987. Returns were calculated using annual investment periods and CAPM theory was used in estimating beta coefficients.

One of the enterprises was a beef feedlot investment and the results indicated a mean real annual return of 15.80% with a standard deviation of approximately 20%. The beta value, on a real basis, was -0.182.

This research project will apply the CAPM relationship to a beef feedlot investment alternative and a broadly diversified portfolio represented by the TSE 300 in order to develop a beta coefficient for the beef investment using MSE to measure errors in predicting returns.

III. METHODOLOGY

A. BEEF FEEDLOT INVESTMENT

A representative feedlot returns model will be specified and used to develop a time series of predicted and realized investments returns on cattle feeding over the period from January, 1973 to December, 1985. Realized returns are a blend of historical and simulated data on physical and market variables that affect cattle investment performance.

Returns are calculated based on a standardized cattle investment starting at the beginning of each month. A lot of 100 head of A1 steers are purchased at a weight of 380 kg and fed to a finished weight of 520 kg.

A prediction of net returns is formulated at the beginning of each investment period using information that is assumed to be available at that time. The realized rate of return is measured at the end of each investment.

A time series of investment errors is developed from the first two time series and used to evaluate the risk involved in these investments as well as forecast future cattle investment risk.

The basic form for rate of return is $\frac{REVENUE}{COST} - 1$.

The models used for predicted and realized returns are presented below in equations 10 and 11.

$$r = K_1 - [K_0 + F + Y + T + P_r + M] \tag{10}$$

$$\hat{r} = \hat{K}_1 - [K_0 + \hat{F} + \hat{Y} + \hat{T} + P_r + M] \tag{11}$$

where: r_a is the realized return

r_e is the predicted return

K_1 is the revenue from cattle sales

K_0 is the total initial cost of the feeder animals

F is the feed cost associated with finishing the animal

Y is the yardage cost associated with finishing the animal

T is the cost associated with disease incidence in the feedlot

P_r is the processing costs for the animals as they enter the feedlot

M is the marketing costs of the animals and where a " ^ " above the term indicates that it is a predicted or forecasted amount as opposed to a known amount.

In these models the revenue component is:

(MARKET PRICE - GRADE DISCOUNT)·(MARKET WEIGHT)
·(NO. OF HEAD)·(1 - DEATH FACTOR)

The cost component is:

(FEEDER PRICE · PURCHASE WEIGHT) + (FEED USED·
FEED PRICE) + (YARD COST·DAYS FED) + (TREATMENT COST
·NO. OF HEAD) + (PROCESSING COST·NO. OF HEAD) +
(MARKET COST·NO. OF HEAD)

The elements of these models are divided into three categories. The first category includes four of these elements (market weight, purchase weight, number of head, and death loss) which are included in the definition of the investment being considered.

The second category of elements are those which are considered to be determinate and include feeder price, yardage cost per day, most of feed cost, processing cost, and marketing cost. Historical time series provides information of feeder prices and feed prices while various empirical sources provide information on the other elements. These determinate elements are used in the development of both predicted and realized return time series.

The third category of elements are those which are considered stochastic. These include market price, grade discount, a small portion of feed cost, feed usage, days fed, and treatment costs. When developing the predicted returns time series the market price is estimated from market information available at the beginning of the feeding period while the non-market stochastic elements are estimated from mean historical results of various empirical sources.

The realized return series uses realized market and feed prices that are obtained from market information at the end of each feeding period while the other values for stochastic elements are obtained via simulation which in turn uses mean and variance data from empirical sources.

In several instances prices are not available as a time series but must be adjusted using a price index. Examples of this include feed hauling costs, feed processing costs, daily yardage fees, daily bedding costs, treatment costs per animal, processing costs per head, buyer's commission per head, and cattle hauling costs. These costs are adjusted using either a single price index or a combination of indices, depending on the variable involved.

The general formula to adjust prices using an index is as follows:

$$PRICE_{\substack{p\\i}} = \frac{INDEX_p}{INDEX_b} \cdot PRICE_b \qquad (12)$$

where: $PRICE_p$ is the price in the period under consideration

$PRICE_b$ is the price in the base period

$INDEX_p$ is the index for the period under consideration

$INDEX_b$ is the index for the base period.

If more than one index is used then each value is weighted by the proportion of the total price change the index represents.

1. REALIZED RETURNS

Equation 10 is the model for realized returns. It looks at the returns on a post-production or historical basis when all revenues, costs, and production variables are known. These returns are measured based on animals being kept for the amount of time required to gain 140 kg which was approximately 90 days and returns are defined as being the revenue remaining after all costs are subtracted off.

While production variables must be assigned a particular value for each time period it is recognized that a number of these variables do have a variance attached to them and will not be the same for each time period. As well, several equations do have random variables included in them and therefore covariance terms may also exist. It is necessary that these variance and covariance relationships be incorporated into the model and to accomplish this a simulation procedure is included when measuring realized returns. This simulation uses measures of mean and variance obtained from empirical sources for the variables in question and generates random values for these variables in order to reflect variation from the mean which can occur naturally. The result is an equation which provides a more accurate measure of variance because an individual observation can deviate from the mean without the mean value being affected, given a large enough sample. A further result is that historical returns are in fact not entirely historical because a random value is chosen based on historical measures of mean and variance. This is a trade-off which is necessary to reflect as accurately as possible the total variation in the model.

The following sections break down equation 10 for realized returns into its various components and includes an explanation of potential variance and covariance relationships which may exist within the equation.

a. REVENUE

The equation for realized revenue is as follows:

$$R_t = W_t \sum_{i=1}^{N} A_{it} P_{it} \tag{13}$$

where: i represents the grade

W_t is the final sale weight of an animal

A_{it} is the percentage of animals at each grade

P_{it} represents the final price.

As indicated, the final sale weight, W_t, is fixed and is therefore not a random variable.

It is necessary to determine if there is a covariance relationship occurring between the grade, A_{it}, and final price, P_{it}, that must be measured. In order for such a relationship to exist it is necessary that a change in one variable is at least partly a result of a change in the other variable.

First of all, can a change in price at a particular grade cause a shift in the percentage of animals marketed at that grade? Higher grades should receive higher prices but if the premium for receiving a higher grade is not large enough to justify the marginal costs associated with achieving that grade (or the reduced amount of product if it entails marketing animals at a lower weight) then producers will not always attempt to obtain this top grade.

However, for the purposes of this research it is assumed that producers do attempt to receive the highest grade possible and that there is a discount for animals that grade lower.

Secondly, can a shift in grade percentages for an individual feedlot affect the prices paid to individual grades? While there is always a discount in price as the grade of an animal decreases the situation can occur where the magnitude of the discount shifts. Assuming that the cause of this shift is due to changes in supply and demand factors when the animals are marketed, then it follows that in order for an individual feedlot to affect the magnitude of a discount between grades it would have to exert some affect on the supply of a particular grade of animal. While it can be argued that an individual feedlot's grades are unique and due to the managers' capabilities it is not reasonable to assume that this feedlot is enough to affect the supply characteristics of the entire market.

This provides the basis for the conclusion used in this study that there is no covariance relationship between the grading percentages for an individual feedlot and the price received for each grade of steer.

As previously mentioned the final weight, W_1, is not a random variable and therefore no covariance exists between final weight and final price in this equation.

This indicates that the variation in revenue will arise from two sources when assuming a fixed final weight and these two sources are price and percentages of animals that fall into each grade.

The variation in price is accounted for through the use of a monthly weighted average price series for A1 and A2 steers sold Direct To Packer.[7]

The decision to use Direct To Packer prices hinged on the fact that almost all cattle are marketed in this manner and are therefore more accurate than Public Stockyard prices.[8] The drawback to using this price series is that prices have only been reported since 1982 while Public Stockyard prices are available for the entire time period being studied. In order to overcome this problem, the two price series were compared for the time period from 1982 to 1985 inclusive and the average price difference between the two price series was calculated. Direct To Packer prices were, on average, three percent higher and this premium was applied to Public Stockyard prices for 1973 through 1981 to arrive at Direct To Packer prices for this time period.

There are additional benefits to Direct To Packer sales besides increased sale price. There is no commission charge for handling and the animals are sold F.O.B. the feedlot so there are no hauling costs for sales. Both of these costs must be considered when selling through a stockyard.

When sold F.O.B. the feedlot there is a four percent shrink to account for anticipated weight loss during hauling. However, this shrinkage would occur to animals hauled to a stockyard as well.

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[7] Market prices for slaughter cattle were obtained from the Canada Livestock and Meat Trade Report which is compiled by Agriculture Canada.

[8] Public Stockyard prices are obtained from the Livestock Market Review which is compiled by Statistics Canada.

In order to determine the discount which will occur due to variance in grades it was necessary to construct a distribution of real grade discounts and run a simulation. This is done by examining the marketings of a number of steer lots from a local feedlot to determine the discounts that accrued due to some animals receiving grades lower than A1.[9] The discounts are based on the marketing of cattle direct to packer. The data were limited to marketings of 20 animals or more because marketings of small groups of animals may reflect a different decision making process or marketing criterion than would be used when large lots of animals are marketed, as is assumed in this study.

This distribution of discounts is converted into real dollar values, grouped into ranges and then a weighted mean discount is calculated for each range based on the number of lots with each discount. The percentage of total lots in each range is then calculated to reflect the chance of each range being chosen through a random process. Using a uniform random number generator a simulation is done and a number is generated for each time period in the study. The discount used is the one which represents the range the random number falls into when chosen. Thus, a discount for each period is chosen randomly according to its frequency of occurrence from the original data. It is then converted to nominal dollars for that period.

The range of real discounts and their corresponding percentages are listed in Table 1 as follows;

TABLE 1 : RANGE AND PROPORTION OF.GRADE DISCOUNTS USED TO CALCULATE REVENUE.

DISCOUNT RANGE ($/CWT)	WT. AVG. DISCOUNT ($/CWT)	WT. AVG. DISCOUNT ($/KG)	PROPORTION (%)
0	0	0	58
0.01-0.09	0.09	0.002	1
0.10-0.19	0.16	0.0035	9
0.20-0.29	0.24	0.0053	10
0.30-0.39	0.35	0.0077	7
0.40-0.49	0.44	0.0097	4
0.50-0.59	0.56	0.0123	3
0.60-0.69	0.63	0.0139	3
0.70-0.79	0.75	0.0165	3
0.90-0.99	0.96	0.0211	2

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[9] Data were gathered from a feedlot using production and marketing techniques similar to this study for each group of steers marketed as to the price received for each grade and the number of animals that fall into each grade. Prices were reported on a rail grade basis and converted to a live weight basis using a dressing percentage of 57% that the feedlot indicated was normal for its operation.

The revised formula to calculate revenue is as follows:

$$K_1 = W_1 \cdot P_{1d} \tag{13.1}$$

where P_{1d} is the revised price for each month which is the A1 price less the discount which occurs due to some animals receiving lower grades.

The results of the calculations on 117 lots of cattle marketed for the 48 month period from January, 1984 to December, 1987 with 20 head or more indicate that there was a mean real discount of $0.0035/kg.

During this period there were no discounts for animals within the A grade. The only discounts occurred when animals graded B1 or lower. This is indicative of the situation during the time period studied and is therefore a relevant and accurate measure of grade variability. Beginning in 1988 animals that graded A2 or lower were discounted from the A1 price. If a data series is examined that includes this time frame then this change would have to be incorporated.

The discount is subtracted from the price for A1 steers for each month of the time period to arrive at a net weighted average price received per kg for each month of the time period being studied.

The number of animals marketed is calculated by subtracting the death loss (0.4%) from the number of animals purchased. The study assumes that 100 animals are in the lot so 99.6 animals are marketed each month.

The price for each month as well as the final weight (520 kg) less a four percent shrink and number of cattle marketed are multiplied to arrive at the gross revenue for each lot of cattle.

b. FEEDER ANIMAL COST

The equation for calculating cost of feeder animals is as follows:

$$K_0 = W_0 \cdot P_0 \cdot Z_0 \tag{14}$$

where: W_0 is the purchase weight of animals

P_0 is the purchase price of feeders

Z_0 is the number of head purchased.

At the beginning of the feeding period, the weight of the animals being purchased is set at 380 kg and all feeder prices are for steers sold through Edmonton Public Stockyards.[10] Since W_0 is not a random variable, there is no covariance term between W_0 and P_0

c. FEED COST

The equations for calculating feed costs are as follows:

$$F = U \cdot P_f - S \cdot U \cdot 0.85 \qquad (15)$$

$$U = G \cdot E \cdot H \qquad (16)$$

where: F is the total feed costs per lot of animals

U is the total amount of feed required (t/lot)

P_f is the price of feed ($/t)

S is the CBOP payment ($/t) and is a constant

0.85 is the proportion of the total feed weight that is barley

E is the number of animals fed, including portions for animals that die or are culled, and is a constant

H is the feed conversion (feed/gain)

G is the total gain per animal.

Equations 15 and 16 are used in the estimation of feed costs for a group of animals.

1. FEED REQUIREMENTS

Equation 16 estimates the total amount of feed which will be required for the animals. It is a function of the total amount of gain, G, the total number of animals fed, E, and the predicted feed conversion, H, which by definition is the units of feed required to produce a unit of gain. The total gain is fixed so there is no covariance to consider with that term. It is assumed that the number of animals being fed are fixed.

Variation in feed requirements is one of the sources of risk associated with feeding cattle. This variation can arise from changes in the feed conversion, daily intake, or rate of gain and because these variables interact, a covariance relationship may exist between two or more of them. Failure to consider these variances will result in underestimation of the total risk. It is also critical that the variance surrounding a particular factor such as feed conversion be measured as accurately as possible.

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[10] Data on prices of 380 kg feeder steers was obtained from Livestock Market Review.

The procedure used in this study was to estimate what levels of daily intake and average daily gain would be achieved using a certain ration and then calculate the corresponding feed conversion using a computer model which incorporates these production parameters.[11] The levels of daily intake and average daily gain are estimated using relationships among these variables that have been developed through animal research trials for given sets of circumstances.[12]

The resulting estimation of feed conversion must have a standard deviation attached to it in order to calculate variation. This cannot be done directly as there is no variance attached to the estimate of feed conversion and no data to calculate a variance directly.

Animal science research trials which use similar rations fed to steers of similar size and type can be used to calculate a standard deviation for the feed conversion used in this study. The research data cited calculates means and standard deviations for daily intake, average daily gain, and feed conversion. It is assumed that the variation in one variable reflects the variation and covariation in the other variables as well because all three interact. This allows for the further assumption that the variance in feed conversion picks up all the relevant variance which will occur in feed requirements.

There are two methods of using the variance associated with feed conversion from the research trials to estimate variance associated with feed requirements in this study.

One method is to transfer the standard deviation values directly and use them as the standard deviation in this study. This approach has a major drawback because it assumes that even though the mean of a variable may change significantly, the variance will not change.

A second method is to assume that the coefficient of variation between the two means does not change.[13] This will mean that while the ratio of the standard deviation to the mean does not change the actual variance will change.

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[11] Formulas for these calculations were obtained from National Research Council (1984).

[12] Information on these relationships can be found in NRC tables for 1984

[13] The coefficient of variation (C.V.) is defined as the ratio of the standard deviation to the arithmetic mean expressed as a percent. See Mason (1986), pp. 175-176.

The latter method was used because it was felt that as the mean level of feed conversion decreases its variance would decrease as well due to physiological factors involving the animal. Therefore, if standard deviation values were transferred directly the potential for error would be much greater than by using the coefficient of variation. Thus it is assumed for this study that as the mean level of feed conversion changes, the ratio of the standard deviation to the mean does not change.

It is important to note the consequences of this assumption being incorrect. If the coefficient of variation is not constant when it is assumed to be so and the actual variance levels do not change, then by moving to a lower mean the variance is understated at the new mean. The opposite effect occurs when moving to a higher mean. The exact direction and magnitude of error depends on the change in both coefficient of variation and actual variance when moving from one mean to another.

The original estimates of daily intake and feed conversion are based on the use of a ration containing 83.5% barley grain, 15% barley silage, and 1.5% minerals and vitamins on an as fed basis. Steers are fed from 380 to 520 kgs assuming an average daily gain of 1.48 kg/day will occur. Based on this a daily intake of 10.50 kgs of feed would be required and feed conversion would be 7.102 kgs of feed/kg of gain.

The source of data from which the standard deviations of feed conversion and ADG are obtained is unpublished data from Alberta Agriculture. It is based on 4200 steers of similar type to those assumed for this study which were finished in various lots from October of 1983 to December of 1984. The ration fed to these steers was also similar to the ration that is assumed to be fed for steers in this study.

The mean and standard deviation for feed conversion was calculated as 8.29 ± 0.39 kg on a dry matter basis. From this a C.V. of 4.7% is calculated.

Using the assumption of a constant C.V. described previously, the standard deviation for feed conversion can be calculated using this C.V. to be 0.33 kg on an as fed basis so that the mean and standard deviation for feed conversion used in this study is 7.102 ± 0.33 kg of feed per kg of gain.

This mean and standard deviation is now multiplied by the number of animals and total gain per animal to get a mean level of feed required and a standard deviation associated with it. Since both of these numbers are constant there is no variance attached to them and there is no covariance to consider.

The number of animals on feed is calculated from the number of animals originally purchased minus the death loss factor.[14] A factor for the feed which the animals consume before they die is also included. It is assumed that animals which die consume 25% of the feed which would have been consumed over a full period in the lot. Assuming 100 animals are purchased for each lot during this study means that the number of animals fed is 99.7 if death loss is 0.4%.

The resulting mean feed requirement is 99,130 kg per lot with a standard deviation of 4,604 kg.

An assumption of the model is that the variance in feed conversion and hence feed requirements is normally distributed. At very low rates of gain the feed conversion rate will be extremely high and approach infinity as rate of gain approaches zero. At very high rates of gain the opposite effect occurs. However, when rate of gain falls within normal ranges the assumption of a normal distribution holds true. This allows for the incorporation of variance using a standard normal distribution of mean zero and variance one where a random value is chosen within this distribution and converted to a random variable within the distribution of feed requirements using the following formula:

$$\lambda = z \cdot \sigma + \mu \tag{17}$$

where: λ is the randomly generated value for a variable
z is the Z-score value
σ is the standard deviation of the variable in question
μ is the mean of the variable.

A simulation procedure to incorporate this variance is done for each month of data in the study. The resulting vector of feed requirements includes a measure of the variance of this parameter in the model.

The result is that a feed requirement is determined via simulation for each month based on the distribution of feed requirement values around the mean value.

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[14] Determination of death loss is discussed more fully under Disease Costs.

2. TOTAL FEED COST

Equation 15 calculates total feed cost. The first term in the equation calculates gross feed costs which is a function of total feed required, U, and feed prices, P_f, with feed price being the price prior to any discounts for Crow Benefit Offset Program (CBOP) eligibility. CBOP will be discussed in further detail in the next section. The total feed required is a random variable in the sense that it is determined by feed conversion, H, which has a variance attached to it.

The existance of a covariance relationship between U and P_f depends on whether a change in one variable will affect the other. If we consider a situation where some factor such as weather conditions create a feed shortage in a region, then feed prices may rise due to lack of supply and therefore a covariance relationship will exist. Unfortunately, empirical measurement of the relationship is very difficult due to lack of available data. For the purposes of this study it is assumed that there are no localized supply restrictions and hence no covariance between feed requirements and the price of feed.

The second term of the equation deducts the benefits from CBOP which are constant on a per tonne basis and thus no covariance relationship exists.

The major source of variance associated with feed costs will come from changes in feed prices. The variance associated with production has been taken into account and the variance in feed prices is picked up in the following manner.

Feed costs are assumed to be paid at the beginning of the feeding period using prices for that month. A block of feed is purchased based on the predicted number of animals to be fed as well as the predicted rate of gain and feed conversion. An adjustment is made during the last month to account for any feed that is left over or any extra feed that is needed using prices for that month. The variation in the price of #1 feed barley is used as a proxy for the variation in feed costs.[15] The assumption is made here that since barley accounts for a very large part of the ration it will be the source of almost all variation that occurs in feed costs. Therefore, other feed components are assumed to make up a constant proportion of feed costs and only vary as barley prices vary. A transportation cost of $6.50 per tonne in 1988 dollars is added on for delivery to the feedlot. This figure is based on the assumption that the grain is hauled 65 km.[16]

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[15] Barley prices are obtained from Alberta Agriculture Statistics Branch and are prices for #1 feed barley delivered to country elevators in the Edmonton region. The data series is available back to January, 1975. Prices for 1973 and 1974 are calculated using a Grain Feed price index for Alberta.

As mentioned above the cost of other feed components is calculated as a percentage of the cost of barley and added on to give total feed costs. In the ration formulated for use in this study barley makes up 92.4% of the cost of the ration whereas all other components combine to make up 7.6%. Any variation in total feed costs will be due almost entirely to changes in barley prices and no significant amount of variation is lost due to this proxy. The total feed price will be calculated as:

$$P_f = P_b \cdot \frac{1}{percent \;\; barley} \qquad (18)$$

where: P_b is the price of barley

$percent \;\; barley$ is the percentage of the initial ration cost attributable to barley.

In this study the equation reduces to:

$$P_f = P_b \cdot 1.082 \qquad (18.1)$$

The cost of feed processing is included as an extra cost. A feed processing cost of $0.241 per bushel ($11.05 per tonne) in 1984 dollars is indexed to current dollars in each period using a farm input price index for supplies and services. This is converted to a price per kg and multiplied by the amount of barley and supplement used in each period to arrive at total feed processing costs per period. As indicated previously, 85% of the total feed is barley and supplement. This cost is added to other feed costs to arrive at a total feed cost.

This feed transformation factor of 1.082 is assumed to be constant and the consequences of this assumption are important to note. Under this condition the ration will not change regardless of the price of the different inputs. For instance, if the price of barley increases it cannot be substituted with another input.

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[16] See Custom Rates Survey Summary for Grain Harvesting Operations, Alberta Agriculture Statistics Branch 1988. Current prices are calculated using a Petroleum price index for Alberta that accounts for 33% of the change in cost and a Machinery and Motor Vehicle Maintenance price index which accounts for 67% of the change in cost.

In an area where alternative feed energy sources are not readily available this assumption may be valid. However, if alternative energy sources exist such as cull potatoes then it may not be possible to make this assumption. However, for the purposes of this study it is assumed that ration components are constant.

Total feed costs are then calculated by multiplying total feed requirements by the price of feed and subtracting off any subsidy payments that are received.

3. STABILIZATION AND SUBSIDIES

Major stabilization and/or subsidy programs can have a significant effect on net returns to producers and can affect risk since they may provide minimum price guarantees. Therefore it is necessary to include the benefits and costs from these programs in the model. It is not possible nor is it practical to attempt to include all stabilization and/or subsidy programs in the model but the major ones are taken into consideration.

The Crow Benefit Offset Program is the only revenue supplementing program considered in this paper. This program was set up and went into effect as of September 1, 1985. It's purpose is to offset distortions in feed grain prices between Western and Eastern Canada that were brought about by Feed Freight Assistance programs for Eastern producers. The program applies to both home-grown and purchased grain. Maximum limits for eligibility are set at six kg of grain/kg of gain for steers that weigh 318-454 kgs and seven kg of grain/kg of gain for steers weighing over 454 kgs. The rate of payment was $21/t from September 1, 1985 until July 1, 1987 and $13/t after July 1, 1987.

Producers receive the discount when they purchase the feed by presenting certificates to the seller who can then redeem them for payment. Therefore, the benefits from this program are shown in the model as a direct and immediate reduction in feed costs[17].

A second program that is not considered in this model but which is worthy of discussion is the National Tripartite Stabilization Beef Program. This program was set up beginning in July of 1986 to provide minimum price guarantees to slaughter cattle producers. There are similar programs available to cow-calf and backgrounding beef producers and participation in all of the programs is voluntary. This program uses a formula based on past five year average prices for each quarter and feeder prices to calculate the minimum price for each quarter. Premiums are paid equally by the producer, the provincial government, and the federal government. It applies to animals marketed over 1000 lb. that have been owned at least 60 days.

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[17] Information on this program is available through CBOP office of Alberta Agriculture in Edmonton.

In July, 1986 the premium was $6.60/head and this increased to $7.40/head on July 1, 1987. There was an initial start-up payment of $13.20 for the second quarter of 1986 as an incentive for enrollment and payments have been made for the fourth quarter of 1987 as well as in several quarters for 1988[18].

This program was not included in this model because it was not in effect during the time period measured. However, it has the potential to greatly affect the risk and return to beef feedlot investment since it reduces the variance which can occur on the lower end of the distribution due to the minimum price guarantee.

d. YARDAGE COST

The equation for total yardage costs is as follows:

$$Y = \frac{140}{D} \cdot J \cdot E + \frac{140}{D} \cdot B \cdot E \cdot O \qquad (19)$$

where: Y is the yardage costs per lot

J is the yardage cost per head per day

B is the bedding cost per head per day

E is the number of animals fed

O is the straw used per head per day

D is the average daily gain

$\frac{140}{D}$ is the days on feed.

Yardage costs vary substantially from operation to operation because there are differences in which types of costs are included. Yardage costs used in this study are made up of yardage charges per day, which include book-keeping and general maintenance, and bedding costs per day. They are based on figures obtained from the 1987 Custom Rate Survey for Livestock Operations published by Alberta Agriculture. Figures are adjusted to reflect current dollars for each period using a Farm Input Price Index. Bedding costs are assumed to be $0.04/head/day in 1987 and the index used is to adjust this cost is legume and grass production costs. Yardage fees are assumed to be $0.15/head/day in 1987 dollars and the index used to adjust this cost is supplies and services in Western Canada. The portion of costs relating to bedding assumes straw is used at a rate of 0.91 kg/head/day and that it is constant and does not vary.

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[18] Information on this program is available through Alberta Agriculture or Agriculture Canada.

One source of variation in yardage costs is the number of days required to raise the animals to a finished weight. This will depend on the average daily gain achieved which, as was stated previously, has a variance attached to it. Therefore, it is necessary to determine the variance around this average daily gain to take full account of the risk associated with yardage costs.

The method used to calculate variance around the daily gain used in this study is similar to that used to determine variance around feed conversion where it is assumed that as the mean of ADG changes the standard deviation does not remain constant but rather the ratio of the standard deviation to the mean is constant. A mean ADG of 1.17 kg was obtained from the sample data with a standard deviation of 0.15 kg. From this a C.V. of 12.82% is determined. In this study an ADG of 1.48 kg is used and when the same C.V. is assumed as with the other study a standard deviation of 0.19 kg is obtained.

The variance surrounding ADG is incorporated using the normal distribution and simulation exercise as outlined for feed requirement variance. The result is that an ADG is determined via simulation for each month based on the distribution of ADG which reflects the variance around the mean value.

Yardage fees are assumed to be paid at the beginning of the feeding period using a discount rate to convert these fees to period one dollars. The rate used will be the prime interest rate and it is assumed that yardage fees would be paid on a monthly basis.

e. DISEASE COST

The equations for calculating treatment costs are as follows:

$$T = Z_0 \cdot V + I \tag{20}$$

$$I = K_0 \cdot 0.01 \tag{21}$$

where: T is the total treatment cost per lot

Z_0 is the number of animals treated

V is the treatment cost per animal

I is the Indemnity Trust Program premium.

One of the factors which has a significant effect on returns is disease. A major difficulty in attempting to measure the effect of death loss and sickness on the risk involved with feedlot investments is the lack of time series data which analyses this aspect of management. It was not possible to locate data which provided a measure of the variance in death loss and treatment costs for different lots of yearling steers over a long period of time. It was therefore necessary to use industry estimates and some cross-sectional data which does provide some estimate of the variables.

While it is recognized that these data are not ideal for this particular situation, it is felt that they do provide a relatively high degree of accuracy in estimating death loss and treatment costs.

In this study disease costs are dealt with in three categories.

1. DEATH LOSS

The first category is the actual death loss which occurs in the feedlot. An average figure of 0.6% is determined based on figures received from Alberta Agriculture and discussions with veterinarians. For the purpose of this study it is lowered to 0.4% to reflect benefits received from death loss assistance programs.

The Livestock Indemnity Trust Program is run by the Feeders Associations of Alberta[19] to assist producers in limiting financial losses due to feedlot deaths. There are two programs available. Plan C provides coverage at a cost for premiums of one percent with a deductable of two percent and a payout value of 90% of the average value of the purchase price of the feeders. Plan D has a premium of 0.5%, a deductable of five percent, and a payout of 100% of the purchase price.

The deductables are one time deductables based on the total value of the animals purchased and is taken off the first claim. If the deductable exceeds the claim then the remaining portion is carried forward to the next claim.

Plan C was chosen to be used in this study. Since the rate of death loss is set at 0.4% there will not be any payouts under this program to the investor. However, it is common that feedlots with low rates of death loss make use of this program as it does provide protection against heavy losses due to death.

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[19] This program is available through most but not all Feeders Associations of Alberta.

This program serves the purpose of reducing the variance in returns due to death loss that cattle feeders endure. Since a set rate of 0.4% is used in this study all variance is assumed away. However, in reality there is some potential variance and this program reduces it to a lesser amount.

Since these programs have a deductable attached to them and since average figures are used for death loss, it is not possible to measure the benefits of this program which accrue when serious death loss occurs. Consequently, the average death loss rate is lowered by 0.2% in order to account for these benefits in measuring returns.

It is recognized that this method may result in an understatement of variance. However, lack of suitable data necessitates its use.

The animals that die are included as a reduction in the ending revenue and show up as a reduction in [illegible]. Animals are assumed to die one quarter of the way into the production period. Therefore, animals that die incur 25% of the costs required to keep the animal for the full feeding period (i.e. feed costs and yardage costs).

2. CULLING DUE TO CHRONIC ILLNESS

The second category is animals that are chronically sick and must be culled out. Although few data are available on the number of yearling steers which fall into this category, all people consulted agreed that the number is extremely low and that rarely does an animal get culled at this stage of growth. Therefore it is assumed that for this study there are no animals culled.

3. TREATMENT COSTS

The third category to consider is treatment costs. A treatment cost per animal is determined and used to calculate total treatment costs per lot. Church and Radostits (1981) estimated treatment costs in feedlots to be $6.94 per head received by the feedlot with a standard deviation of $2.25 expressed in July, 1978 dollars based on 249,144 animals studied. This cost and variance is converted to current dollars for each time period using the Farm Input Price Index. These two figures provide an estimate for ~~total treatment~~ costs as it is calculated in equation 10. The standard deviation is used to calculate the effect of variance in treatment costs on the overall risk in the feedlot investment using the same simulation techniques that which was used for variance in feed requirements and ADG.

Since the animals lost to death or chronic sickness are included as animals not sold, the only actual costs in this category will be the treatment costs which are paid at end of the feeding period.

f. PROCESSING COSTS

The equation for processing costs is as follows:

$$P_r = Z_0 \cdot P_p \tag{22}$$

where: P_r is the total processing costs

Z_0 is the number of animals purchased

P_p is the processing costs per animal.

Processing costs are those costs associated with getting the animal ready to enter the feedlot and includes items such as growth implants and vaccines. This is not a random variable but rather is a known cost. It is adjusted to refle[illegible] current dollars through de-indexing with the Farm Input Price Index for supplies and services in Western Canada. The processing cost in June, 1987 dollars is $2.75 with $1.25 being delegated for implants, $1.00 for vaccination, and $0.50 for eartags as determined through consultation with Farm Management Specialists at Alberta Agriculture.

g. MARKETING COSTS

The equation for marketing costs is as follows:

$$M = Z_0 \cdot Q_0 + W_0 \cdot L_0 \tag{23}$$

where: M is the total marketing cost per lot

Z_0 is the number of animals purchased

Q_0 is the buyer's commission for purchasing animals ($/hd.)

W_0 is the purchase weight of the animals

L_0 are the [illegible]cking costs for purchasing animals.

There are several charges to consider when buying and selling cattle. In most cases cattle buyers are hired to purchase cattle for the investor and are paid on a per head basis. Transportation costs for getting cattle to the feedlot are calculated as being a certain amount per loaded mile. Since cattle are sold F.O.B. the feedlot there are no charges for selling cattle or costs for trucking them.

In this study a buyer's charge of $5/hd. in 1988 dollars is used based on discussions with cattle buyers in the Edmonton region. This is adjusted to reflect current dollars using the supplies and services index.

In order to calculate trucking costs assumptions must be made as to the distance that cattle are hauled to the feedlot. It is assumed that the cattle are hauled 210 km when being hauled to the feedlot. The rates for trucking are taken from the 1987 Custom Rates Survey for Livestock Operations and are set at $1.25/loaded km in 1987 dollars using a truck with a capacity of 10,900 kg. Trucking rates are converted to current dollars using the Farm Input Price Index for fuel (33%) and motor vehicle maintenance (67%).

h. NET RETURNS

The calculation of the various revenue and cost categories then allows for the measurement of net returns using equation 10.

All cost figures are expressed in period zero dollars while revenue is expressed in period three dollars. Costs are converted to period zero dollars using a present value formula set up as follows:

$$PV_0 = C_0 + \frac{(C_1)}{(1+r_d)} + \frac{(C_2)}{(1+r_d)^2} + \frac{(C_3)}{(1+r_d)^3} \qquad (24)$$

where: PV_0 are the total costs in period zero

C are the costs paid out in each designated period

r_d is the discount rate.[20]

In this case a nominal discount rate is used and is calculated as:

$$r_d = r_p + \Omega \qquad (25)$$

where: r_p is the prime interest rate

Ω is the rate charged above prime.[21]

Note that the decision to use a discount rate above prime assumes that the investor is borrowing funds to make the investment. If it was assumed that the investor was in a lending position then it would be necessary to use a rate below prime to reflect the return received on money being loaned.

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[20] See Brealey et al (1986). P. 28.

[21] The prime interest rate is obtained from Cansim and is the Chartered Bank Prime Business Loan Rate.

Net returns are measured by subtracting all costs from revenue. The effects of inflation between time periods is removed using the general C.P.I. for Canada. This ensures that all dollars are in real terms and allows for comparison between time periods.

Returns are also expressed as a proportion per time period using the following formula:

$$\frac{ending \quad cashflow}{beginning \quad cashflow} - 1 \qquad (26)$$

2. PREDICTED RETURNS

Equation 11 is a model for calculating predicted returns. This equation uses realized values for parameters that are known and estimates for the variables which are not known. The theory behind the structure of the equation (such as elimination of covariance terms) is similar to equation 10. The primary difference lies in the source of data.

Whereas equation 10 used historical values and their historical means and variances to arrive at values for the variables, equation 11 uses futures prices and predicted values for parameters where the precise values are not known. In most cases the predicted value used is the mean value that was calculated. Variances are not incorporated into this equation since it is measuring predicted values.

a. PREDICTED REVENUE

The equation for predicted revenue is as follows:

$$\hat{R}_1 = \hat{W}_1 \cdot \hat{P}_{1a} \qquad (27)$$

The predicted final price, $\hat{P}_1$, can be determined from one of several sources. One method is to take it as a function of the futures price applicable to when the cattle are sold less the mean discount for grades. Since there is no Canadian futures market, the futures prices are monthly weighted averages of live beef cattle futures taken from the Chicago Mercantile Exchange in American dollars and must be converted to Canadian dollars using exchange rates. The futures market for exchange rates is used to do this conversion rather the current exchange rates at the beginning of the feeding period because it gives the most accurate forecast of what the rates will be at the time of sale. Future exchange rates are based on 90 day spot exchange rates obtained from the Cansim data base.

In order to account for differences between Edmonton and Chicago prices due to basis it was necessary to subtract the predicted basis for each time period from the Chicago price. Predicted values are obtained from data for the current time period rather than historical time periods to reflect investor expectations.

The real basis values for each time period were calculated and were tested for time trends and seasonality to arrive at adjusted predictions of basis values for each time period. Appendix A provides a complete discussion of how the predicted basis values were determined.

A second method of forecasting final price is to use the futures price on a particular date during the month rather than a monthly average. The same procedure would be used to convert to Edmonton prices.

A third method of estimation would be to use the current cash price in the month the animals are purchased as an estimate of final price.

A MSE comparison of the price series data being considered in this study similar to that done by Leuthold (1977) showed that lagged cash prices had a slightly smaller MSE (0.0187) than either monthly weighted average futures prices (0.0196) or a futures price for a particular day of the month (0.0207). There is little difference in the values and when a comparison was done between monthly futures and lagged cash prices it was discovered that cash prices on average had an error of $ 0.02/kg from realized prices while there was virtually no error when using monthly futures prices. Based on this it was decided that monthly futures prices would be used as the predicted sale price for the animals.

b. FEEDER ANIMAL COST

The values for initial weight, W_0, and initial price, P_0, are known when the cattle are purchased.

c. PREDICTED FEED COSTS

The equation for predicted feed costs is as follows:

$$\hat{F} = \hat{O} \cdot P_f - S \cdot \hat{O} \tag{28}$$

$$\hat{O} = G \cdot \hat{E} \cdot \hat{A} \tag{29}$$

Predicted feed costs are calculated based on the predicted level of feed conversion being estimated which in this case is its mean value. Again, this differs from equation 10 where variances for each variable are used to calculate an assigned value which takes production risk into account. Since feed costs are paid at the beginning of the feeding period the price of feed is known. The number of animals fed is fixed and is based on predicted levels of death loss and the length of time the animals are in the feedlot before they die. Both estimates are the same as for realized returns. The CBOP payment is known and is the same as for equation 10.

d. PREDICTED YARDAGE COSTS

The equation to estimate yardage costs is as follows:

$$\hat{Y} = \frac{140}{\hat{D}} \cdot J \cdot E + \frac{140}{\hat{D}} \cdot B \cdot E \cdot O \tag{30}$$

Yardage costs for this equation are calculated based on the yardage and bedding costs per day being known in advance and the number of days being a function of the predicted rate of gain. The number of animals is also estimated based on predicted death loss for steers during the feeding period. Since the death loss is assumed to be set at 0.4% then this number is assumed to be known.

e. PREDICTED TREATMENT COSTS

The equation to estimate predicted treatment costs is as follows:

$$T = Z_0 \cdot \hat{V} + I \tag{31}$$

Estimates for death loss and disease costs for this equation are the same as in equation 10 except that treatment costs use a predicted value and do not have a variance attached to them. The I.T.P. premiums are the same as for equation 10 as they are known as soon as the animals are purchased.

f. PREDICTED PROCESSING COSTS

The equation for estimating processing costs is as follows:

$$P_r = Z_0 \cdot P_p \tag{32}$$

Since the costs are incurred almost immediately they are assumed to be known with certainty.

g. MARKETING COSTS

The equation for estimating marketing costs is as follows:

$$M = Z_0 \cdot Q_0 + W_0 \cdot L_0 \tag{33}$$

Costs of buying and trucking purchased animals are estimated based on the number of animals and the costs being known beforehand which is similar to equation 10.

h. PREDICTED NET RETURNS

The calculation of predicted net returns in equation 11 is similar to realized returns in equation 10. All costs are expressed in period zero dollars while revenue is in period three dollars. Discount rates are in nominal terms.

Nominal returns were then converted to real returns using the CPI which is a general index. While the use of a predicted deflator is more conceptually correct, it would require that covariance relationships between the predicted return and predicted inflation rate be measurable. Since this is not the case it is more accurate to use a known inflation rate. Empirically, there is very little difference since the time period for the investment is only three months and the amount of error in predicting inflation rates would be very small.

The use of this method also allows for the assumption that T-bills are riskless.

B. DIVERSIFIED PORTFOLIO INVESTMENT

The measurement of a beta value for an investment requires that the variance in returns for that investment be compared to the variance of returns in a diversified portfolio of investments. In this case the diversified portfolio is represented by the TSE 300 index. The procedure for measuring returns is similar to that used for the beef investment where realized and predicted returns are measured for each period and the variance is calculated.

1. REALIZED RETURNS

A TSE 300 Total Returns index is used to measure realized returns to a diversified portfolio for the period of January, 1973 to December, 1985. The formula for measuring nominal returns is:

$$r_n = \frac{c_t}{c_{t-3}} - 1 \tag{34}$$

where: r_n is the nominal rate of return

c_t is the Total Returns Index for month three of each investment period

c_{t-3} is the Total Returns Index for month zero of each investment period.

Nominal rates of return are converted to real rates of return to allow for comparison of different investment periods.

$$r_r = \frac{(1 + r_n)}{(p_t / p_{t-3})} - 1 \tag{35}$$

where: r_r is the real rate of return

p_t is the CPI for month three of each investment period

p_{t-3} is the CPI for month zero of each investment period.

2. PREDICTED RETURNS

The predicted rate of return on a diversified portfolio of investments is measured by calculating the mean of the realized time series of returns for both nominal and real values. The investor does not know what the variance on the investments will be but does know the historical mean and can use this knowledge to form his predictions of what future returns will be. The realized time series of returns for the period being studied (in this case 1973-1985) is used in calculating the mean rather than historical data in order to reflect the investor's predictions of what would happen during the period. The purpose in doing this is to eliminate naive variation.

This differs from the beef investment where the investor bases predictions on his predicted values for a defined series of events and parameters such as feed conversion or ADG.

C. ANALYSIS

The procedure outlined above provides two models which calculate predicted returns and realized returns on a monthly basis for the time period specified. These models for predicted and realized returns allow for use of the Mean Square Error approach which is used to measure variation in realized returns from predicted returns with variance of the beef investment, σ_x^2, being calculated as outlined in Intriligator (1978).

$$\sigma_x^2 = \frac{1}{(n-1)}\sum_{j=1}^{n}(X_j-\hat{X}_j)^2 \tag{36}$$

where X_j is the realized or observed return on the beef investment and $\hat{X}_j$ is the predicted return on the investment.

The variance on the market portfolio, σ_y^2, is calculated in the same manner where:

$$\sigma_y^2 = \frac{1}{(n-1)}\sum_{j=1}^{n}(Y_j-\hat{Y}_j)^2 \tag{37}$$

The market portfolio used in this research is the TSE 300 Index.

The covariance between X and Y is measured using the following formula:

$$COV(X.Y) = \frac{1}{(n-1)}\sum_{j=1}^{n}(X_j-\hat{X}_j)(Y_j-\hat{Y}_j) \tag{38}$$

This then allows for the calculation of the beta coefficient for beef, β_x, as follows:

$$\beta_x = \frac{COV(X.Y)}{\sigma_y^2} \tag{39}$$

The correlation coefficient can be used to calculate the systematic and non-systematic components of risk. The correlation coefficient is defined as:

$$\rho_{x.y} = \frac{COV(X.Y)}{\sigma_x \cdot \sigma_y} \tag{40}$$

The two components of risk are then measured as follows:[22]

systematic: $\rho_{x.y}\sigma_x$ (41)

non-systematic: $(1-\rho_{x.y})\sigma_x$ (42)

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[22] See Levy and Sarnat (1982), pp. 299-301 or Turvey and Driver (1987), p. 391.

IV. ANALYSIS AND RESULTS

This chapter is broken down into four sections. The first section summarizes results from the beef feedlot investment and compares it to the market portfolio.

The second section discusses the results for various investment alternatives considered in the study.

Section 3 discusses the sources of risk in the model and their effects on total risk.

Section 4 looks at tests done for autocorrelation in returns and error terms.

A. BEEF FEEDLOT INVESTMENT

These results reflect an investment alternative where a 100 head lot of heavy feeder steers are purchased each month over a 13 year period from 1973 to 1985, placed on a custom feedlot, and fed to a slaughter weight using a barley-based finishing ration. The animals are purchased at a weight of 380 kg and fed to a weight of 520 kg over a time period of approximately 90 days.

Appendix D lists the realized returns on a beef feedlot investment for each month from January, 1973 to December, 1985. Returns are expressed as percentages and are on an annual basis. Quarterly returns are converted to an annual basis multiplying by four. The mean real annual return over this period was 6.32%. A graphical description of the movement in realized returns over this period is provided by Figure 1.

Appendix E lists the realized returns on the market portfolio, represented by the TSE 300 Total Returns Index, for each month from January, 1973 to December, 1985 as well as the realized returns on 90 day T-bills for the same period. The mean real annual returns on the market portfolio was 4.65% while the mean annual return on T-bills was 1.41%. Figure 2 shows the movement in realized market returns over this period. Figure 3 shows the movement in T-bill returns over this period.

Table 2 summarizes the risk and return measurements for the beef feedlot investment alternative and the diversified portfolio.

TABLE 2 : MEAN, MSE, AND BETA VALUE FOR BEEF INVESTMENT AND DIVERSIFIED PORTFOLIO (ANNUAL).

	MEAN RLZED RETURN (%)	MSE	ROOT MSE (%)	BETA B	CORR. COEFF $r_{(x,y)}$	SYS. RISK (%)	NON SYS. RISK (%)
FEEDLOT	6.32	1690.2	41.1	0.64	0.59	24.2	16.9
PTFOL.	4.65	1417.1	37.6	1.00	1.00	37.6	0.0

The results show that for the beef feedlot investment the average annual returns are 6.32% and have a root mean square error of 41.1%. This alternative provides a higher return than the diversified portfolio which has a mean return of 4.65% but it also has a higher level of risk as the root MSE on the portfolio is 37.6%. This is consistent with theory which states that higher levels of risk require higher returns to compensate for this risk.

Table 2 lists the beta coefficients for the beef feedlot investment and the market portfolio. The market portfolio will have a beta of one which is the average beta of all securities or investments in the portfolio. The feedlot investment has a beta of 0.64 which indicates that the beef feedlot investment's systematic risk is 64% of the market systematic risk and that the beef investment is less affected by market risk movements than the market portfolio.

A one percent movement in market risk will mean a 0.64% movement in the risk of the beef investment. This investment will decrease the beta of the portfolio if added to it and increase returns as well.

The calculation of a correlation coefficient between the total risk on an investment and the risk on a market portfolio allows for measurement of the systematic and nonsystematic proportions of total risk.

The market portfolio, since it is assumed to be totally diversified, has a correlation coefficient of one and all of its risk is systematic.

The feedlot investment is shown to have systematic risk of 24.2% and nonsystematic risk of 16.9%. On a proportional basis, this shows that nonsystematic risk makes up 41.1% of the total risk in the investment.

These results allow for interesting comparisons with other studies that were outlined in the literature review.

FIGURE 1

REALIZED NET RETURNS

BEEF (1973-85)

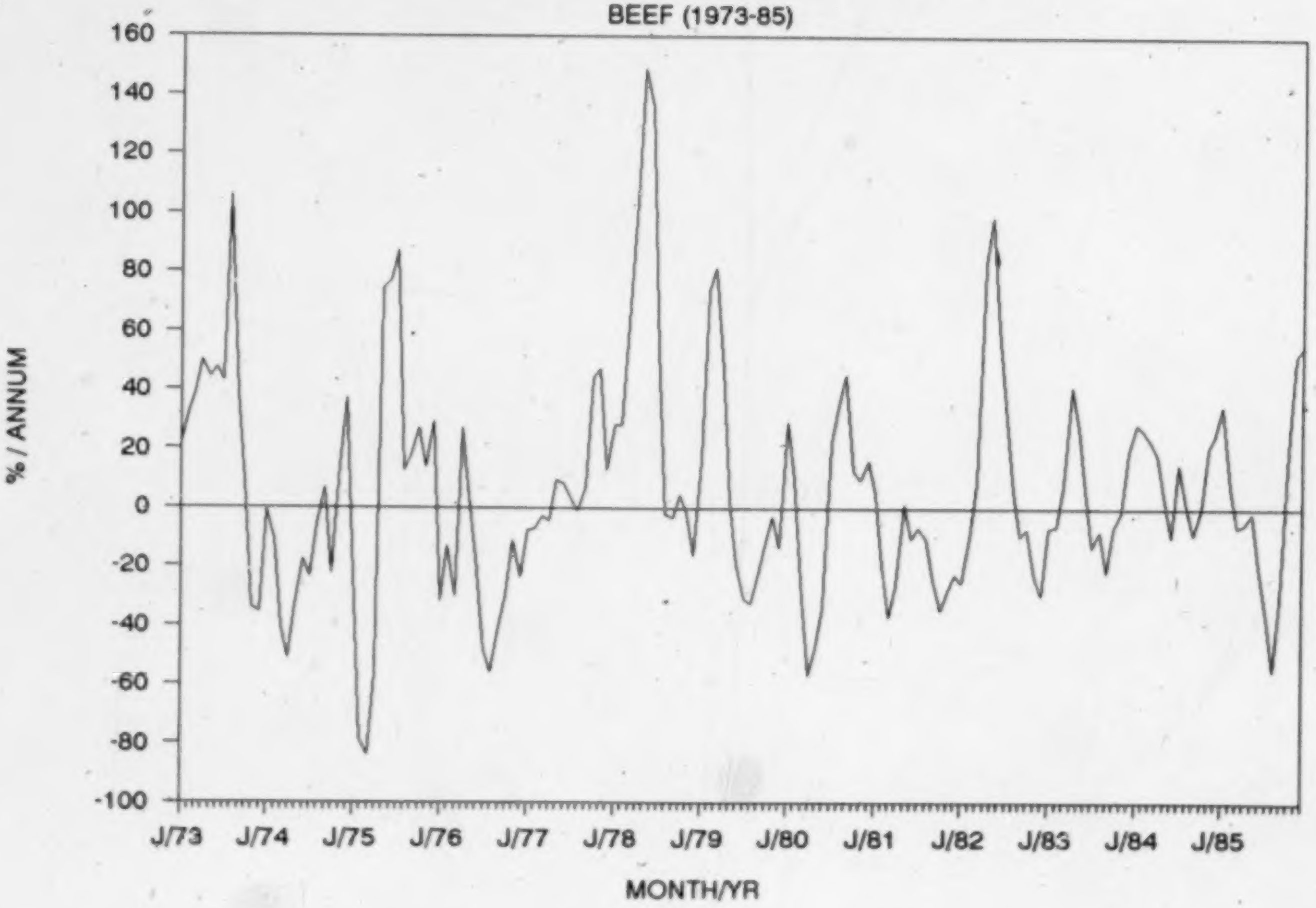


FIGURE 2

REALIZED NET RETURNS

MARKET (1973-85)

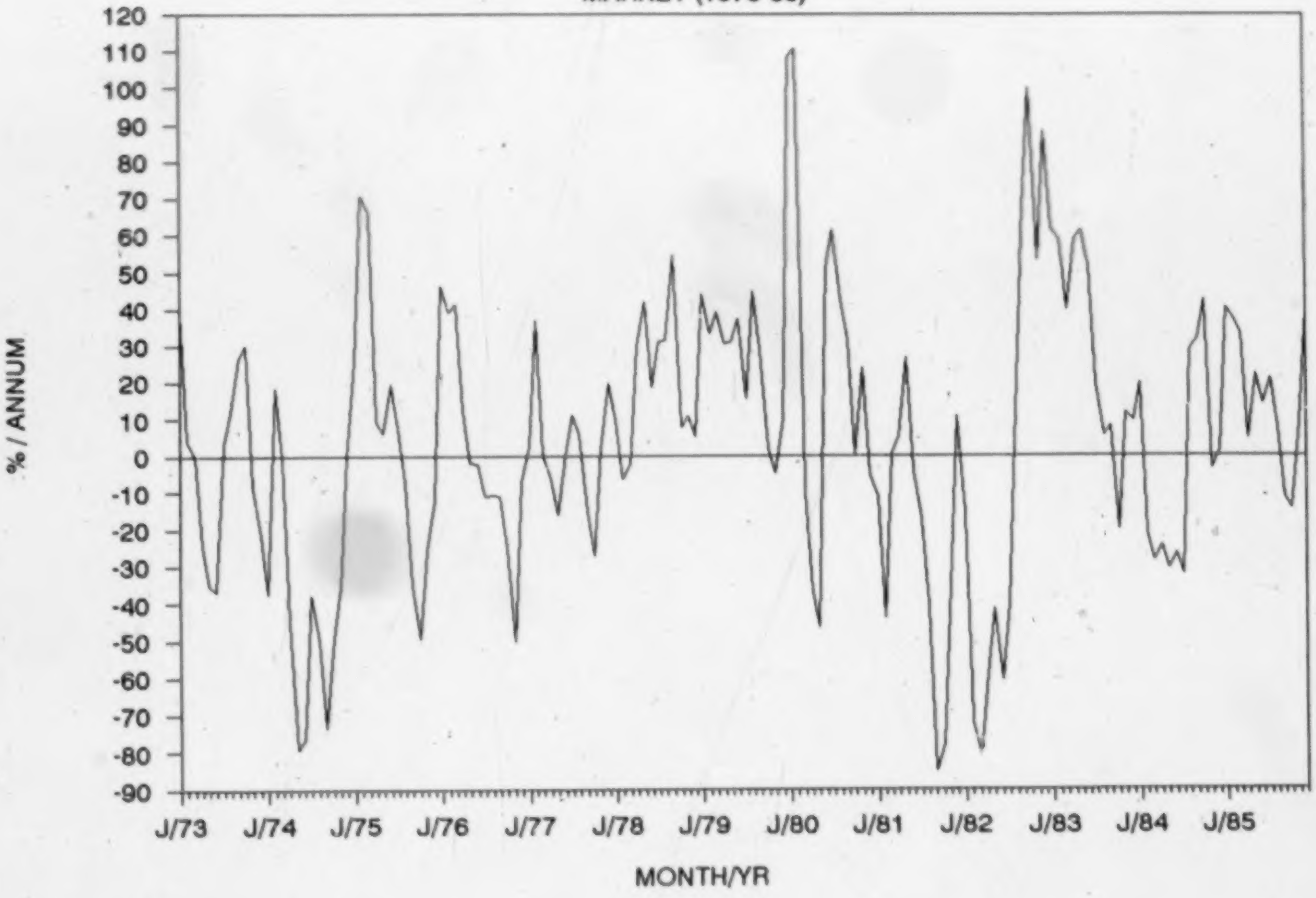
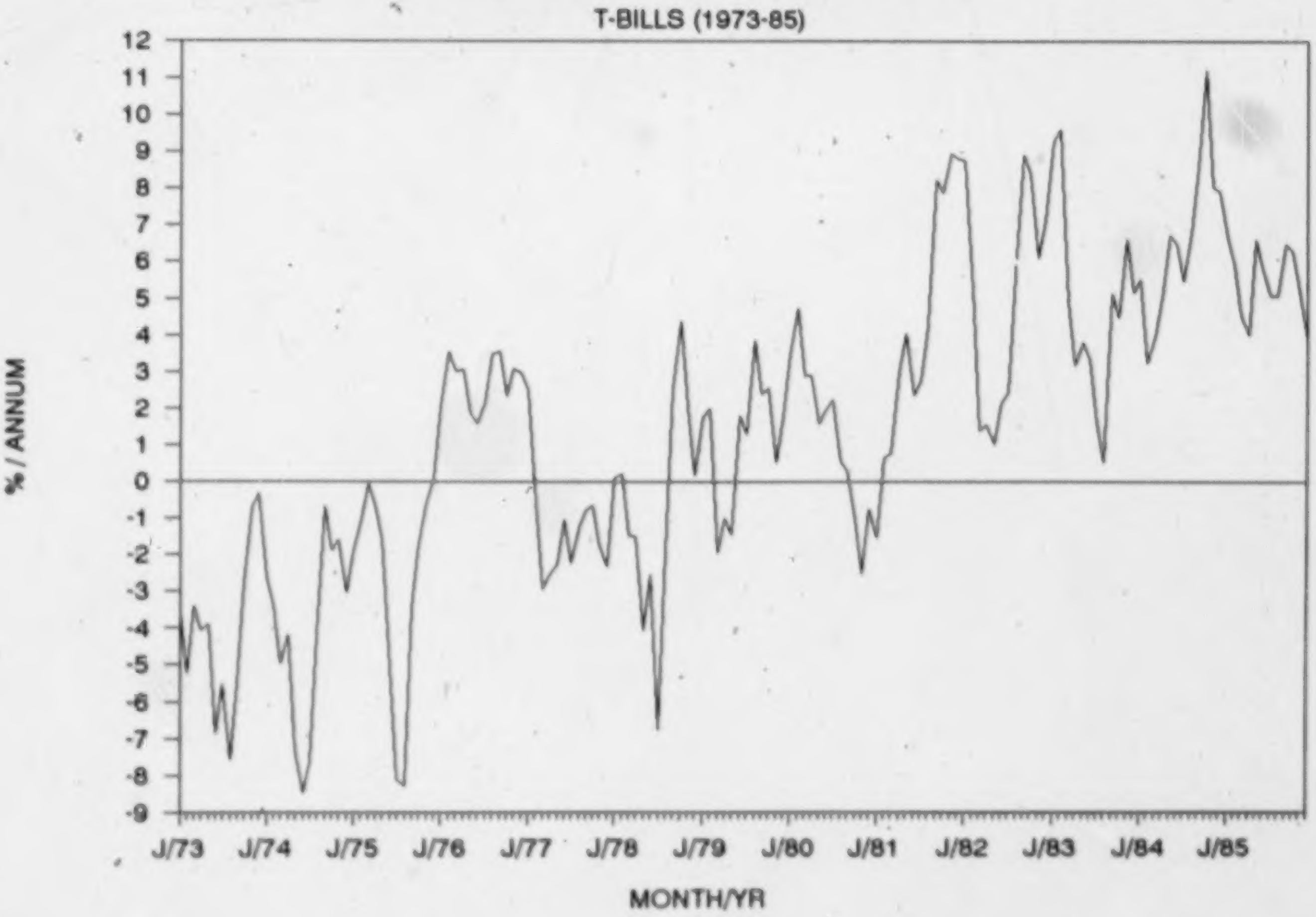


FIGURE 3

REALIZED NET RETURNS



T-BILLS (1973-85)

The study by Brown (1989) covering approximately the same time period indicated real net returns much higher than those obtained in this study (15.80% as opposed to 6.32%) and risk levels much lower (20% as opposed to 41%). While the exact method of calculation from Brown's study was not available it seems unlikely that real net returns would be this high over a 15 year period and it seems equally unlikely that returns between Alberta and Saskatchewan would vary this much.

The beta value which Brown calculated was also much lower than for this study (-0.182 as opposed to 0.64). Part of the reason for this might be the much lower overall risk levels calculated and the possibility of the level of systematic risk being underestimated.

Turvey and Driver (1987) also calculated a beta value for a beef feedlot investment but it was based on a farm portfolio rather than a market portfolio. The applications of this beta value are thus limited to questions of diversification within agriculture and their conclusion (their beta value was 0.91) indicated that diversifying within agriculture would be of little use for beef. It does not indicate the effects of beef investments on a more general portfolio.

The beta calculated here (0.64) indicates that there are possible benefits to diversification strategies where beef investments are included in a portfolio of investments including non-agricultural assets.

B. INVESTMENT STRATEGIES

Table 3 provides a comparison of the results of the various investment strategies that were considered.

TABLE 3 : MEAN, MSE, AND BETA VALUE FOR INVESTMENT ALTERNATIVES (ANNUAL).

	MEAN RLZED RET. (%)	MSE	ROOT MSE (%)	BETA B	CORR. COEFF $r_{(x,y)}$	SYS. RISK (%)	NON SYS. RISK (%)
STRAT. 1	6.32	1690.2	41.1	0.64	0.59	24.2	16.9
STRAT. 2	9.00	1170.3	34.2	0.40	0.44	15.1	19.1
STRAT. 3	13.48	1951.4	44.2	0.66	0.56	24.8	19.4
PORTFOLIO	4.65	1417.1	37.6	1.00	1.00	37.6	0.0
T-BILLS	1.41	0.0	0.0	0.0	-	-	-

Strategy 1 assumes that investments are made in beef feeder cattle for every month over the 13 years.

Strategy 2 assumes that the investor is more selective and that the decision to invest in the feedlot is based on the predicted nominal returns on the beef investment being greater than the nominal returns to a 90 day T-bill. When anticipated returns for the T-bills are greater than for the beef cattle the investment will be in the T-bills.

Strategy 3 uses the same decision process for selecting investments as strategy 2 except that the return and risk measurements are based only on the periods in which beef investments were made. For instance, if 100 out of the 156 time periods had predicted beef returns higher than T-bill returns for that period then these 100 time periods would be used to calculate mean returns and risk levels. The intent of this strategy is to isolate the returns and risk for the beef investment under conditions where the decision to invest is constrained by having predicted returns higher than T-bill returns.

The fourth alternative is the market portfolio which was descibed earlier as being represented by the TSE 300 Total Returns Index.

The fifth alternative is to invest in a riskless asset. In this case the riskless asset is represented by 90 day Treasury Bills.

Strategy 2 had a mean real annual return of 9.00% and a root MSE of 34.2%. The higher returns from strategy 1 were due to the replacement of most high negative beef returns with T-bill returns. The risk level was also lower because the T-bills are a riskless asset. This indicates that strategy 2 is superior to strategy 1 because of higher returns and lower risk.

The beta value for strategy 2 is 0.40 which is lower than for strategy 1. This indicates that strategy 2 would contribute less risk to a portfolio than strategy 1. It is also much lower than the beta for the diversified portfolio which is 1.0. This investment strategy, when added to the portfolio, would lead to higher returns and lower levels of risk for the portfolio.

Strategy 3 provides mean real annual returns of 13.48% and a root MSE of 44.2%. The higher returns as compared to strategy 1 are due to most of the large negative returns being eliminated by the selective process. While returns do increase significantly, the overall risk level only increases slightly. This would indicate that the investor could increase average returns in beef feedlot investments and still not increase risk levels by being selective and only choosing to invest when returns exceed those offered by riskless investments.

The beta value for strategy 3 is 0.66. While the beta is not significantly different from strategy 1 the higher level of returns means that adding this investment to the portfolio (keeping in mind that this investment is only made during certain periods) will mean that the beta of the portfolio is decreased and average returns are increased. The levels of systematic and nonsystematic risk for this alternative were virtually the same as for strategy 1.

The T-bill investment has a mean real annual return of 1.41%. While it has considerably lower return than any of the other investments it also has no risk. It will have a beta of 0 because it is a riskless investment and therefore market risk movements do not affect it. Based on this it would be a good investment to add to the portfolio in terms of reducing risk but due to its low average return, the average returns of the portfolio would decrease as well.

C. SOURCES OF RISK

As outlined in the methodology section, there are several differences in the predictive model from the realized model. Four of these differences involve variance in production parameters while the other one is slaughter price. In order to isolate the portion of MSE contributed by the four production variables their mean values were placed into the realized returns model and the MSE was measured again in order to see how much reduction in MSE occurred. The magnitude of the reduction in MSE would indicate what portion of risk is attributable to these factors. The resulting MSE is virtually unchanged which means that the only source of variation between realized and predicted returns is the variation between realized and predicted slaughter price. The risk due to production variables is so small it does not affect total MSE. In this case the variation in slaughter price is the difference between the realized price and the futures contract price.

MSE can be separated into components to reflect the effects of revenue, costs, and the covariance between these two variables.[23] The equation to measure total MSE is as follows:

$$TOTAL\ MSE = MSE_{(rev)} - 2COV_{(rev.cost)} + MSE_{(cost)} \qquad (43)$$

$$TOTAL\ MSE = MSE_{(rev)} - 2COR_{(rev.cost)} \cdot RMSE_{(rev)} \cdot RMSE_{(cost)} + MSE_{(cost)} \qquad (43.1)$$

Table 4 lists the components of MSE and the proportions of the total which each one exhibits. They are listed in real dollars as opposed to percentages.

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[23] Refer to Appendix C for a mathematical description of the components of variation in this model.

TABLE 4 : COMPONENTS OF BEEF INVESTMENT MSE ($/LOT)

	MSE	ROOT MSE
REVENUE	116,756,328	10,805
$2*COV_{(rev.cost)}$	1,717,212	-
COST	875,347	936
TOTAL	115,914,462	10,766

As can be seen from Table 4 almost all risk is due to variation in revenue with the other components being insignificant. These numbers further the conclusion that virtually all of the risk involved in investing in beef feeder cattle is due to slaughter price changes and not changes in production variables which would affect costs.

D. TESTS FOR TRENDS OVER TIME AND AUTOCORRELATION

Several tests were conducted to determine, first of all, if there was a trend over time in the level of returns or level of risk that were measured and secondly, if autocorrelation exists with realized net returns or with risk. The results are shown in Table 5. All tests assume a 5% confidence level.

TABLE 5 : TESTS FOR TRENDS AND AUTOCORRELATION

	T-STAT	T-STAT CRIT. VALUE	R^2	DURBIN H-STAT	D.F.
TREND - RET.	-0.457	1.96	0.0014	-	154
TREND - ERROR	-2.934	1.96	0.0529	-	154
A.C. - RET.	13.341	1.96	0.5377	4.72	153
A.C. - ERROR	6.939	1.96	0.2390	2.36	153

The first test was to regress realized net returns against time. The resulting t-statistic was calculated to be -0.457 which is below the critical value of 1.96 and thus indicates that time was not significant in affecting the level of net returns and that no trend is apparent in the data over the time period studied.

The second test was to regress errors in predicting net returns against time. The resulting t-statistic of -2.934 indicates that time was significant in affecting returns and that during the time period studied there was some type of trend occurring in the data.

Tests were also conducted to detect the existence of autocorrelation in net returns and in the error term. The statistic used for these tests is the Durbin-h statistic and is calculated using the following formulas:

$$h = \hat{\rho}\sqrt{\frac{n}{1 - n\cdot(VAR\beta_1)}} \tag{44}$$

$$\hat{\rho} = 1 - 0.5d \tag{45}$$

where; n is the number of observations

$\hat{\rho}$ is the rho value for the Durbin-Watson statistic

d is the Durbin-Watson statistic

$VAR\beta_1$ is the sampling variance in the coefficient of the independent variable in the regression.[24]

The test for autocorrelation in the realized net returns series resulted in an h-statistic of 4.72 which indicates the existence of autocorrelation at the 95% confidence level.[25]

The test for autocorrelation in the series of error terms between realized and predicted returns resulted in an h-statistic of 2.36 which indicates the existence of autocorrelation at the 95% confidence level.[26]

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[24] For further discussion on the use of the Durbin-h statistic consult Johnston (1984) or Johnson, Johnson, and Buse (1987).

[25] The actual calculation of the h-statistic for this test is as follows;

$$\hat{\rho} = 1 - 0.5(1.4531) = 0.27345$$

$$h = 0.27345\sqrt{\frac{155}{1 - 155(0.0031)}}$$

$$h = 0.27345\sqrt{298.36} = 4.72$$

[26] The actual calculation of the h-statistic for this test is as follows;

$$\hat{\rho} = 1 - 0.5(1.8155) = 0.09$$

$$h = 0.09\sqrt{\frac{155}{1 - 155(0.005)}}$$

$$h = 0.09\sqrt{688.89} = 2.36$$

V. CONCLUSIONS

The results of this study have shown that:

1. Continuous investment in heavy beef feeder steers over the period from January, 1973 to December, 1985 yielded average real annual returns of 6.32% with a root MSE of 41.1%.

2. The beta value of the beef investment is 0.64. This indicates that if it was incorporated into a market portfolio the overall beta of the portfolio would be decreased and average returns would be increased, thus making it a potentially attractive investment alternative.

3. The proportion of nonsystematic risk in the beef investment is relatively high, thus indicating that a large portion of the risk can be diversified away.

4. When a strategy is considered whereby predicted nominal beef returns are compared to predicted to predicted nominal T-bill returns the average real annual returns rise to 9.0% and the RMSE decreases to 34.2%.

5. A third strategy of selective investment in this enterprise whereby investment is only undertaken when predicted nominal returns exceeded the nominal returns on treasury bills results in a much higher average rate of return (13.48%) with no change in the level of risk.

6. Almost all of the risk in this investment can be attributed to errors in predicting slaughter price. Production variables had a negligible effect on risk.

7. Tests for time trends and autocorrelation indicate that there is a trend in the prediction errors of net returns for beef and autocorrelation in the realized returns. Neither of these issues were investigated in greater detail.

In the course of conducting this research several areas which necessitate further study have become apparent.

Death loss is a harsh reality for feedlot operations and potentially a source of high risk, depending on the capabilities of the feedlot manager. Unfortunately, there is no sound data available on the aspect of death loss and morbidity rates for feedlots that could be used in this study to measure its effects. Research to develop this data is necessary in order to refine risk estimates for beef feedlots.

In certain instances assumptions were made as to covariance relationships between variables in the model. Although in most cases these assumptions can be adequately explained there are cases where this approach was necessitated through lack of data. An example of this would be the relationship between localized feed restrictions and the price of feed.

No attempt was made to consider the consequences of Tripartite Stabilization on risk levels as it was not in effect during the time period being covered by this study. A further study of the risk and returns to a similar investment under Tripartite Stabilization is necessary to determine the effects of this program.

Further analysis of autocorrelation or trends which occur in the data might be beneficial in improving the accuracy of predicting beef investment returns.

Accurate investment decisions require information that reflect as closely as possible current conditions. It is therefore necessary that the database developed for this study be continually updated to ensure that risk and return estimates reflect the most recent information available.

The purpose of this study has been to develop a better understanding of the sources of risk facing an investor in beef feeder cattle, to measure the returns and risk associated with this enterprise, and to examine how this investment alternative may fit into an investor's portfolio. While it has limitations which must be recognized and considered, it nonetheless serves to develop a base of information and ideas from which the understanding and study of risk as it pertains to beef production can be improved.

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APPENDIX A - BASIS PREDICTION

The first step in predicting basis values for each time period was to calculate the real basis by subtracting realized prices from futures prices for each time period and converting them to real dollars using a CPI. The next step was to account for any trends that may have occurred in the real basis over time.

If it was assumed that there was no trend over time then the predicted basis values for each period could be found by calculating the average real basis and converting it to nominal dollars for each respective time period. Figure 4 shows that when average annual basis values were plotted there appeared to be an upward trend over time. In order to determine the significance of this trend the real basis values were regressed against time periods.

The regression equation to predict basis values is as follows:

$$\hat{y} = \alpha + \beta(x)$$

where: $\hat{y}$ is the dependent variable (predicted basis)

α is the constant term

β is the coefficient of the independent variable and measures the slope of the dependent variable

x is the independent variable (time period).

The regression determined the following values for the coefficients:

$$\alpha = -0.053$$

$$\beta = 0.001425$$

$$st.\ err.\ of\ \beta = 0.000387$$

The null and alternative hypothesis for this test is as follows:

$$H_o: \beta = 0$$

$$H_a: \beta \neq 0$$

A t test value is calculated where:

$$t = \frac{\beta}{st.\ err._{(\beta)}}$$

$$t = \frac{0.001425}{0.000387} = 3.68$$

The critical t value at a 5% confidence level is 1.96 which indicates that the null hypothesis is rejected and there is a significant trend.

In order to incorporate this trend the regression equation outlined above is used to predict real basis values for each period which are then converted to nominal values using a CPI.

The second consideration in predicting basis is the existence of seasonality in the data. Figure 5 indicates the average monthly basis over this 13 year period. It would initially appear that there is a lot of seasonality in the data due to large fluctuations between months. However, when a t test is done it was found that due to the large standard deviation within months this seasonal variation was not significant from a predictive point of view because all calculated t values are inside the critical range. Therefore, seasonality was not considered when predicting basis values. Table 9 lists the data used in determining the significance of seasonality.

TABLE 6: MONTHLY BASIS VALUES: 1973-1985

MONTH	MEAN $/KG	S.D. $/KG	S.E. $/KG	T-VALUE
JAN	0.07	0.19	0.05	0.20
FEB	0.08	0.23	0.06	0.36
MAR	0.09	0.21	0.06	0.57
APR	0.02	0.23	0.06	-0.58
MAY	0.01	0.27	0.07	-0.63
JUN	0.04	0.25	0.07	-0.32
JUL	0.09	0.23	0.06	0.51
AUG	0.10	0.26	0.07	0.52
SEP	0.01	0.22	0.06	-0.74
OCT	0.05	0.15	0.04	-0.26
NOV	0.07	0.23	0.06	0.19
DEC	0.07	0.18	0.05	0.26

CRITICAL T VALUE: 2.179
MEAN OF WHOLE PERIOD: 0.06
ST. ERR. OF MEAN: 0.05

FIGURE 4

AVERAGE ANNUAL BASIS

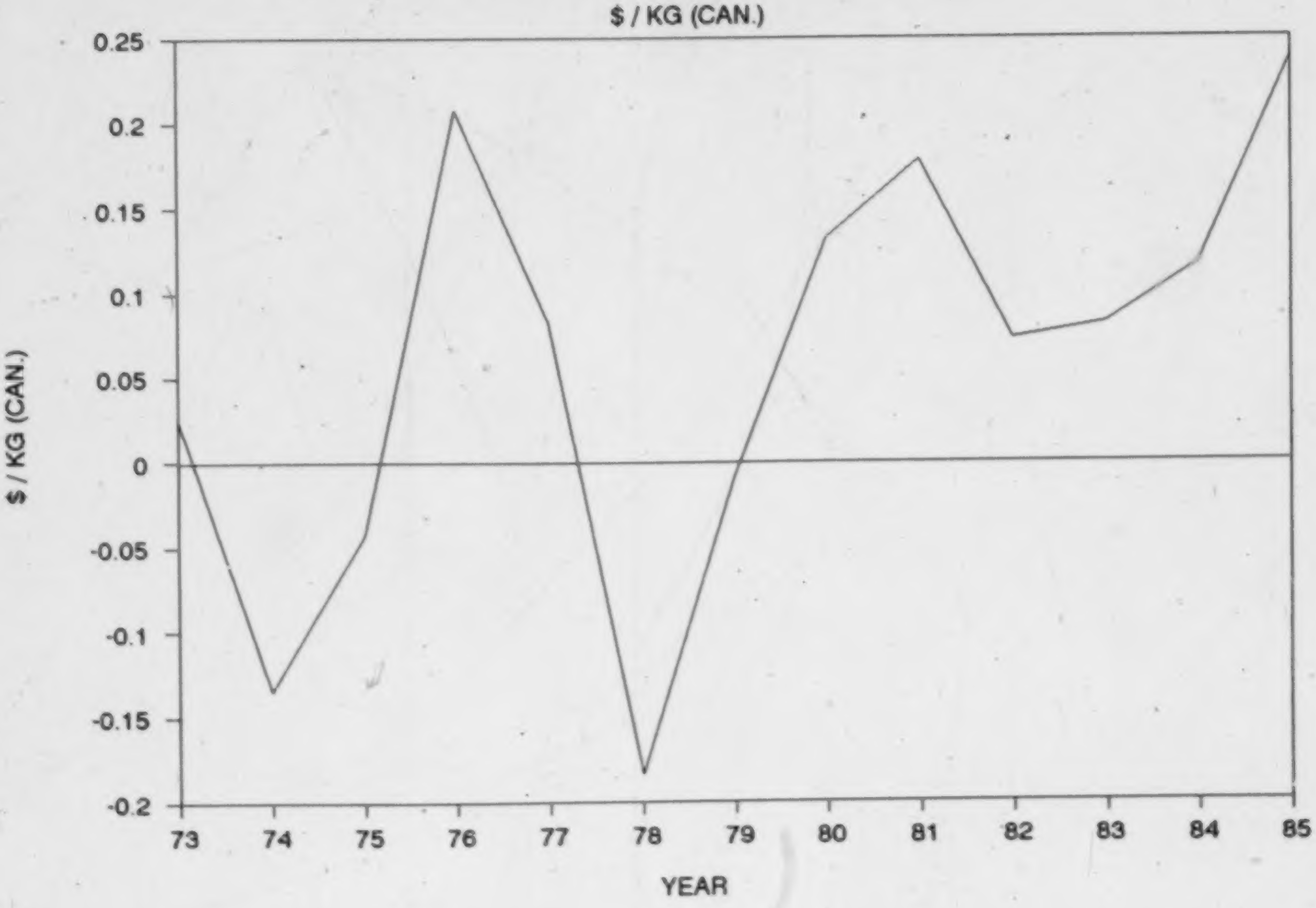
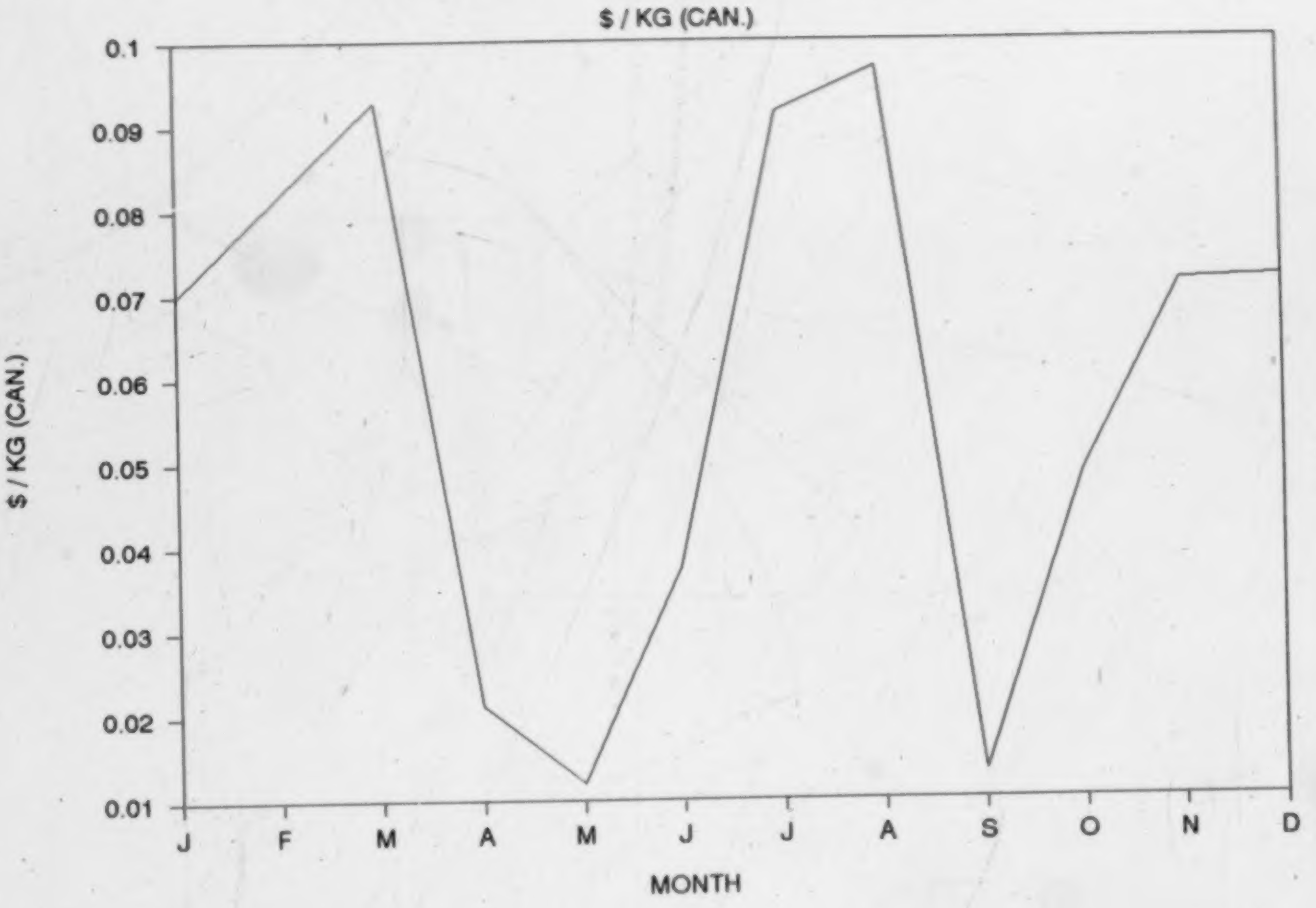


FIGURE 5

AVERAGE MONTHLY BASIS



APPENDIX B - STANDARD ERROR RISK MEASUREMENT

One question which arose from the research would be the effect on risk of spreading feedlot investments out over a number of feedlots in order to minimize the risk associated with management practices. In order to measure the effects of this strategy standard deviation measurements for several variables were replaced by standard error measurements. Standard error is measured using the following formula:

$$S.E. = \frac{S.D.}{\sqrt{n}}$$

where; $S.E.$ represents standard error

$S.D.$ represents standard deviation

n is the number of observations.

The S.E. was then used in the simulation procedure in place of S.D. to measure the variance in three variables; feed conversion, average daily gain, and treatment costs.

The simulation with feed conversion was conducted using S.E. in order to reduce variance in feed requirements. Average daily gain was altered in order to reduce variance in yardage costs and treatment costs were altered to see if the variance could be reduced there as well.

The results are shown below in Table 7. There is practically no change in any of the categories from when standard deviation was used.

This seems to concur with results found when these individual sources of variation were measured and found not to be contributing any variation to the investment. If these variables are not contributing to risk then there would not be any benefit to spreading the investment around to different feedlots in order to reduce risk. The main source of risk is slaughter prices and this is assumed to be the same for all feedlots.

If death loss variations were included in the model it might be possible that diversification of an investment among feedlots might be beneficial but this theory was not testable with this model.

TABLE 7 : BEEF INVESTMENT RISK AND RETURN USING STANDARD ERROR.

MEAN RET.	MSE	ROOT MSE	BETA
6.60	1716	41.4	0.64

APPENDIX C - MSE COMPONENTS

The MSE can be broken down into its components in the following manner ;

$$MSE = \frac{\left(\sum_{i=1}^{n}[(P_iY - \hat{P}_iY) - (C_i - \hat{C}_i)]^2\right)}{n-1}$$

$$MSE = \frac{\left(\sum_{i=1}^{n}[Y(P_i - \hat{P}_i) - (C_i - \hat{C}_i)]^2\right)}{n-1}$$

$$MSE = \frac{\left(\sum_{i=1}^{n}[Y^2(P_i - \hat{P}_i)^2 - 2Y(P_i - \hat{P}_i)(C_i - \hat{C}_i) + (C_i - \hat{C}_i)^2]\right)}{n-1}$$

$$MSE = Y^2\sum_{i=1}^{n}\frac{(P_i - \hat{P}_i)^2}{n-1} - 2Y\sum_{i=1}^{n}\frac{[(P_i - \hat{P}_i)(C_i - \hat{C}_i)]}{n-1} + \sum_{i=1}^{n}\frac{(C_i - \hat{C}_i)^2}{n-1}$$

$$MSE = Y^2VAR_{(p)} - 2YCOV_{(p,c)} + VAR_{(c)}$$

$$MSE = VAR_{(rev)} - 2YCOV_{(p,c)} + VAR_{(c)}$$

where; MSE is the mean square error

Y is the total kg of beef for sale and is constant

P_i is the observed price of beef per kg

$\hat{P}_i$ is the predicted price of beef per kg

C_i is the observed total cost of producing beef per lot

$\hat{C}_i$ is the predicted cost of producing beef per lot

n is the number of observations

i is the time period.

APPENDIX D - ANNUAL BEEF INVESTMENT RETURNS (%)

PERIOD	RLZED	PRDTED	PERIOD	RLZED	PRDTED
JAN/73	21.94	80.22	JAN/76	-31.60	14.52
FEB/73	31.96	77.68	FEB/76	-12.66	49.50
MAR/73	39.07	15.78	MAR/76	-30.04	17.40
APR/73	50.36	49.22	APR/76	27.41	-0.46
MAY/73	44.12	42.00	MAY/76	3.95	19.30
JUN/73	47.26	36.30	JUN/76	-17.14	1.08
JUL/73	43.25	20.89	JUL/76	-48.32	29.32
AUG/73	106.13	41.11	AUG/76	-55.66	14.49
SEP/73	38.66	29.48	SEP/76	-40.30	19.73
OCT/73	8.97	53.31	OCT/76	-29.63	17.29
NOV/73	-33.67	56.86	NOV/76	-10.73	44.88
DEC/73	-35.64	-24.41	DEC/76	-23.39	1.17
JAN/74	-0.82	-62.86	JAN/77	-7.40	40.92
FEB/74	-10.52	-61.95	FEB/77	-7.01	41.00
MAR/74	-40.30	6.50	MAR/77	-2.65	41.27
APR/74	-50.75	15.56	APR/77	-4.20	15.38
MAY/74	-32.96	2.45	MAY/77	9.66	33.38
JUN/74	-17.27	-22.37	JUN/77	8.37	40.67
JUL/74	-23.10	-19.48	JUL/77	3.11	56.29
AUG/74	-5.82	-69.33	AUG/77	-0.80	34.40
SEP/74	7.08	-82.44	SEP/77	7.43	-0.10
OCT/74	-22.25	-21.74	OCT/77	44.10	-3.13
NOV/74	14.45	-4.32	NOV/77	47.36	-7.19
DEC/74	37.09	-31.23	DEC/77	13.14	3.31
JAN/75	-22.52	5.28	JAN/78	28.42	19.21
FEB/75	-78.17	-42.90	FEB/78	28.47	1.88
MAR/75	-83.84	-39.55	MAR/78	69.05	15.73
APR/75	-56.39	-52.33	APR/78	104.31	4.54
MAY/75	74.79	-19.54	MAY/78	148.89	25.54
JUN/75	77.29	-11.80	JUN/78	136.11	37.89
JUL/75	87.60	19.17	JUL/78	54.08	18.34
AUG/75	12.72	13.67	AUG/78	-1.73	16.22
SEP/75	17.67	11.87	SEP/78	-3.03	-44.35
OCT/75	27.01	-7.15	OCT/78	4.75	-35.51
NOV/75	13.76	17.51	NOV/78	-1.51	-54.62
DEC/75	29.40	89.13	DEC/78	-16.02	-0.31

PERIOD	RLZED	PRDTED
JAN/79	16.63	-5.10
FEB/79	74.24	5.57
MAR/79	81.76	21.64
APR/79	47.27	13.24
MAY/79	2.83	-3.00
JUN/79	-18.79	-9.35
JUL/79	-30.87	3.72
AUG/79	32.23	2.28
SEP/79	-23.51	-23.57
OCT/79	-11.12	-26.75
NOV/79	-2.67	-15.68
DEC/79	-13.11	-2.80
JAN/80	29.51	21.78
FEB/80	10.09	45.75
MAR/80	-30.19	16.93
APR/80	-56.66	-20.60
MAY/80	-47.06	3.57
JUN/80	-34.03	1.22
JUL/80	22.43	8.19
AUG/80	34.77	17.88
SEP/80	45.60	13.32
OCT/80	12.83	8.42
NOV/80	9.80	-3.31
DEC/80	16.22	3.71
JAN/81	5.21	13.38
FEB/81	-19.56	-1.09
MAR/81	-37.14	-3.75
APR/81	-25.93	-19.71
MAY/81	1.53	4.57
JUN/81	-9.97	-13.13
JUL/81	-6.71	3.28
AUG/81	-9.96	-6.86
SEP/81	-23.74	-8.26
OCT/81	-34.60	-22.11
NOV/81	-27.87	12.67
DEC/81	-22.66	28.86
JAN/82	-25.41	16.27
FEB/82	-9.94	17.19
MAR/82	8.46	-36.44
APR/82	83.80	4.11
MAY/82	99.18	14.18
JUN/82	61.76	32.29
JUL/82	30.84	14.79
AUG/82	6.40	25.15
SEP/82	-9.51	-12.67
OCT/82	-7.00	0.42
NOV/82	-23.25	6.49
DEC/82	-29.59	-9.12
JAN/83	-6.67	4.20
FEB/83	-6.37	-23.10
MAR/83	8.09	-13.92
APR/83	41.75	-7.18
MAY/83	27.80	10.33
JUN/83	6.67	21.67
JUL/83	-13.34	10.40
AUG/83	-7.73	5.28
SEP/83	-21.64	-26.00
OCT/83	-6.48	-23.70
NOV/83	-1.02	-21.35
DEC/83	19.88	-8.78
JAN/84	28.74	-20.51
FEB/84	26.47	-3.45
MAR/84	23.14	13.30
APR/84	18.62	8.53
MAY/84	2.81	8.02
JUN/84	-9.67	24.32
JUL/84	15.30	6.82
AUG/84	1.00	10.89
SEP/84	-9.05	0.36
OCT/84	0.08	9.30
NOV/84	20.70	14.00
DEC/84	25.68	16.50
JAN/85	34.95	19.46
FEB/85	7.31	25.78
MAR/85	-6.01	22.99
APR/85	-5.43	20.06
MAY/85	1.40	41.37
JUN/85	-19.32	34.00
JUL/85	-36.79	22.56
AUG/85	-55.47	19.77
SEP/85	-30.53	-3.44
OCT/85	14.53	-20.38
NOV/85	51.96	1.53
DEC/85	55.23	10.23

APPENDIX E - REAL ANNUAL TSE 300 AND 90 DAY T-BILL RETURNS (%)

PERIOD	TSE	T-BILL	PERIOD	TSE	T-BILL
JAN/73	39.78	-3.54	JAN/76	46.13	2.06
FEB/73	4.33	-5.21	FEB/76	39.07	3.54
MAR/73	-0.24	-3.39	MAR/76	41.27	3.02
APR/73	-24.18	-4.06	APR/76	12.39	3.06
MAY/73	-35.17	-3.89	MAY/76	-1.91	1.89
JUN/73	-36.65	-6.86	JUN/76	-2.20	1.59
JUL/73	3.27	-5.51	JUL/76	-10.97	2.20
AUG/73	11.98	-7.57	AUG/76	-10.65	3.49
SEP/73	26.82	-5.52	SEP/76	-10.95	3.56
OCT/73	30.03	-2.78	OCT/76	-24.94	2.34
NOV/73	-8.52	-0.70	NOV/76	-49.99	3.09
DEC/73	-21.08	-0.30	DEC/76	-7.05	2.98
JAN/74	-37.40	-2.60	JAN/77	2.87	2.49
FEB/74	18.54	-3.36	FEB/77	36.90	-0.12
MAR/74	-0.69	-4.94	MAR/77	0.09	-2.92
APR/74	-44.72	-4.17	APR/77	-6.25	-2.55
MAY/74	-79.26	-7.27	MAY/77	-15.86	-2.24
JUN/74	-76.38	-8.48	JUN/77	0.38	-1.02
JUL/74	-37.55	-7.61	JUL/77	11.12	-2.20
AUG/74	-49.65	-4.16	AUG/77	5.76	-1.24
SEP/74	-73.25	-0.66	SEP/77	-15.05	-0.78
OCT/74	-49.15	-1.86	OCT/77	-27.27	-0.66
NOV/74	-35.37	-1.59	NOV/77	1.73	-1.73
DEC/74	-0.18	-3.02	DEC/77	19.89	-2.31
JAN/75	25.69	-1.89	JAN/78	9.79	0.11
FEB/75	70.68	-1.17	FEB/78	-6.34	0.21
MAR/75	66.10	-0.07	MAR/78	-2.25	-1.47
APR/75	9.21	-0.65	APR/78	29.60	-1.49
MAY/75	6.23	-1.59	MAY/78	41.95	-4.06
JUN/75	19.57	-5.02	JUN/78	18.46	-2.51
JUL/75	7.32	-8.08	JUL/78	30.96	-6.75
AUG/75	-7.00	-8.29	AUG/78	31.19	-1.88
SEP/75	-35.04	-3.44	SEP/78	54.59	2.55
OCT/75	-49.59	-1.68	OCT/78	7.56	4.40
NOV/75	-25.55	-0.54	NOV/78	10.59	2.07
DEC/75	-12.00	0.08	DEC/78	5.06	0.18

PERIOD	TSE	T-BILL
JAN/79	43.86	1.77
FEB/79	33.09	2.01
MAR/79	39.04	-1.92
APR/79	30.23	-1.00
MAY/79	30.91	-1.41
JUN/79	37.26	1.81
JUL/79	15.49	1.32
AUG/79	44.57	3.87
SEP/79	28.97	2.41
OCT/79	1.74	2.55
NOV/79	-4.85	0.54
DEC/79	9.85	1.80
JAN/80	108.73	3.50
FEB/80	110.85	4.73
MAR/80	-9.72	2.91
APR/80	-36.63	2.89
MAY/80	-46.36	1.61
JUN/80	50.79	1.97
JUL/80	61.40	2.26
AUG/80	42.21	0.56
SEP/80	31.46	0.32
OCT/80	0.28	-0.99
NOV/80	23.86	-2.51
DEC/80	-5.30	-0.75
JAN/81	-10.78	-1.50
FEB/81	-43.94	0.65
MAR/81	0.48	0.81
APR/81	5.14	3.03
MAY/81	26.63	4.06
JUN/81	-4.26	2.39
JUL/81	-17.31	2.74
AUG/81	-40.59	4.29
SEP/81	-85.01	8.24
OCT/81	-77.84	7.90
NOV/81	-35.44	8.93
DEC/81	10.59	8.80
JAN/82	-15.18	8.76
FEB/82	-71.96	5.28
MAR/82	-80.84	1.40
APR/82	-59.27	1.55
MAY/82	-41.29	1.04
JUN/82	-60.67	2.15
JUL/82	-40.07	2.43
AUG/82	21.00	6.18
SEP/82	67.54	8.92
OCT/82	100.17	8.38
NOV/82	53.17	6.11
DEC/82	88.36	7.14
JAN/83	61.63	9.27
FEB/83	58.95	9.60
MAR/83	39.50	4.92
APR/83	58.77	3.20
MAY/83	61.45	3.80
JUN/83	51.70	3.34
JUL/83	19.40	1.63
AUG/83	5.29	0.54
SEP/83	8.00	5.14
OCT/83	-19.96	4.49
NOV/83	11.73	-6.64
DEC/83	9.60	5.19
JAN/84	19.78	5.52
FEB/84	-21.23	3.25
MAR/84	-28.35	3.95
APR/84	-24.28	5.01
MAY/84	-30.47	6.74
JUN/84	-26.46	6.50
JUL/84	-31.93	5.49
AUG/84	28.71	6.81
SEP/84	32.01	8.58
OCT/84	42.51	11.23
NOV/84	-3.58	8.04
DEC/84	1.53	7.92
JAN/85	40.20	6.72
FEB/85	37.10	5.92
MAR/85	33.54	4.55
APR/85	4.62	4.01
MAY/85	22.35	6.61
JUN/85	14.27	5.80
JUL/85	21.07	5.08
AUG/85	7.52	5.07
SEP/85	-11.20	6.48
OCT/85	-14.31	6.31
NOV/85	8.89	5.24
DEC/85	39.38	3.93

APPENDIX F - NOMINAL REALIZED NET RETURNS

MM/YR	NET RET. %	NET RET. $/LOT	REVEN. $/LOT	STEER COST $/LOT	FEED COST $/LOT	YARD COST $/LOT	TRT. COST $/LOT	PROC. COST $/LOT	MKT. COST $/LOT
Jan-73	7.36	2,953	43,054	32,596	5,573	495	799	95	544
Feb-73	10.39	4,192	44,540	32,805	5,274	652	979	95	544
Mar-73	11.71	4,931	47,055	34,368	5,820	674	623	95	544
Apr-73	14.81	6,158	47,746	32,922	6,587	545	886	97	553
May-73	13.20	5,706	48,930	34,844	6,292	588	850	97	553
Jun-73	14.97	6,592	50,633	36,249	5,968	582	593	97	553
Jul-73	13.67	6,090	50,649	35,112	7,265	647	874	100	562
Aug-73	30.58	13,556	57,884	35,237	6,861	798	771	100	562
Sep-73	12.67	6,012	53,455	38,088	7,241	609	843	100	562
Oct-73	4.38	2,156	51,355	39,217	7,913	544	854	100	571
Nov-73	-6.90	-3,724	50,217	43,714	7,989	603	963	100	571
Dec-73	-7.41	-3,920	48,953	43,196	7,526	545	934	100	571
Jan-74	2.04	1,094	54,643	41,934	9,195	638	1,096	102	583
Feb-74	-0.25	-135	53,178	40,805	10,520	554	749	102	583
Mar-74	-7.53	-3,823	46,934	38,155	10,675	615	626	102	583
Apr-74	-10.41	-5,674	48,815	41,566	10,892	802	521	105	603
May-74	-5.14	-2,798	51,603	40,521	11,609	945	619	105	603
Jun-74	-0.75	-379	50,419	36,675	11,661	712	1,042	105	603
Jul-74	-2.28	-1,213	52,020	36,985	13,783	716	1,028	108	613
Aug-74	1.57	816	52,764	37,453	12,153	635	986	108	613
Sep-74	4.08	2,016	51,366	34,686	12,234	834	875	108	613
Oct-74	-3.07	-1,568	49,457	36,358	12,332	826	746	112	650
Nov-74	6.31	3,129	52,686	33,390	13,370	853	681	112	650
Dec-74	12.51	5,794	52,110	31,091	13,189	747	527	112	650
Jan-75	-3.21	-1,497	45,209	30,096	14,314	925	584	115	673
Feb-75	-17.79	-8,561	39,559	32,487	12,797	974	1,075	115	673
Mar-75	-19.54	-9,718	40,021	33,724	13,723	764	741	115	673
Apr-75	-12.56	-5,827	40,564	30,840	12,906	752	1,084	119	690
May-75	21.02	8,795	50,644	28,240	10,971	877	952	119	690
Jun-75	22.69	9,769	52,816	29,352	11,182	819	885	119	690
Jul-75	26.40	11,214	53,689	29,402	10,684	698	861	122	709
Aug-75	7.13	3,277	49,222	33,306	10,191	765	852	122	709
Sep-75	7.11	3,281	49,436	34,201	9,499	826	798	122	709
Oct-75	9.11	4,173	50,003	33,716	9,825	750	664	126	750
Nov-75	5.52	2,512	47,994	30,623	11,904	964	1,116	126	750
Dec-75	9.51	3,983	45,875	29,210	10,586	674	546	126	750
Jan-76	-6.53	-2,903	41,577	30,899	10,888	831	953	130	778
Feb-76	-2.05	-870	41,566	29,310	10,848	683	687	130	778
Mar-76	-6.30	-2,733	40,677	30,305	10,698	967	532	130	778
Apr-76	8.25	3,497	45,881	29,118	10,913	788	647	132	785
May-76	2.63	1,179	46,032	30,857	10,852	1,061	1,166	132	785
Jun-76	-2.58	-1,136	42,926	31,375	9,867	892	1,010	132	785
Jul-76	-10.66	-4,888	40,957	33,248	9,859	819	986	136	798
Aug-76	-12.81	-5,865	39,909	33,365	9,845	851	779	136	798
Sep-76	-8.93	-4,092	41,736	32,470	10,573	909	941	136	798
Oct-76	-5.94	-2,536	40,179	30,447	9,481	861	984	138	804
Nov-76	-1.30	-533	40,461	29,268	8,953	931	900	138	804
Dec-76	-4.52	-1,918	40,563	29,854	10,179	791	716	138	804

MM/YR	NET RET. %	NET RET. $/LOT	REVEN. $/LOT	STEER COST $/LOT	FEED COST $/LOT	YARD COST $/LOT	TRT. COST $/LOT	PROC. COST $/LOT	MKT. COST $/LOT
Jan-77	-0.32	-124	38,916	27,396	9,030	893	758	140	822
Feb-77	0.39	148	38,240	26,894	8,629	801	805	140	822
Mar-77	2.11	822	39,762	26,961	9,315	820	882	140	822
Apr-77	1.54	625	41,268	27,429	9,723	1,123	1,385	143	839
May-77	4.91	2,006	42,845	28,825	9,482	860	690	143	839
Jun-77	4.25	1,792	43,966	29,812	9,468	913	1,000	143	839
Jul-77	3.19	1,380	44,587	30,731	9,516	981	979	145	854
Aug-77	1.88	820	44,467	31,308	9,621	1,096	622	145	854
Sep-77	3.81	1,700	46,269	32,178	9,653	947	792	145	854
Oct-77	13.14	5,776	49,742	32,545	8,036	1,323	1,046	148	867
Nov-77	14.29	6,242	49,938	32,947	7,481	1,034	1,219	148	867
Dec-77	5.68	2,560	47,628	33,607	8,311	1,202	933	148	867
Jan-78	8.95	3,977	48,405	33,524	7,861	1,021	988	151	884
Feb-78	8.95	4,036	49,133	34,987	7,143	1,106	827	151	884
Mar-78	19.75	8,789	53,283	34,527	6,884	1,062	986	151	884
Apr-78	28.75	13,852	62,034	36,851	8,319	948	1,010	155	900
May-78	41.07	20,627	70,851	39,150	7,470	1,166	1,383	155	900
Jun-78	37.37	20,046	73,684	42,736	8,214	963	671	155	900
Jul-78	17.76	10,377	68,806	46,958	8,113	1,266	1,048	155	890
Aug-78	2.01	1,313	66,584	53,462	7,852	1,427	1,485	155	890
Sep-78	0.59	401	68,766	57,508	7,411	1,100	1,302	155	890
Oct-78	2.13	1,454	69,646	57,358	7,556	916	1,308	157	898
Nov-78	1.21	829	69,082	57,851	6,669	1,179	1,500	157	898
Dec-78	-1.95	-1,368	68,631	59,172	7,072	1,162	1,539	157	898
Jan-79	6.08	4,309	75,138	59,866	7,306	1,123	1,449	162	923
Feb-79	20.89	14,481	83,798	58,135	7,437	1,247	1,413	162	923
Mar-79	24.06	17,087	88,101	60,610	7,090	957	1,272	162	923
Apr-79	15.01	11,677	89,490	66,679	7,739	1,027	1,244	168	956
May-79	3.69	3,166	89,087	73,978	8,285	1,331	1,202	168	956
Jun-79	-2.64	-2,387	88,005	79,152	7,477	1,138	1,501	168	956
Jul-79	-5.62	-4,985	83,668	76,494	8,064	1,155	1,795	172	972
Aug-79	-6.57	-5,732	81,577	74,763	9,201	1,071	1,130	172	972
Sep-79	-4.01	-3,460	82,896	73,083	9,707	1,054	1,368	172	972
Oct-79	-0.86	-713	81,983	70,174	8,615	1,199	1,547	174	987
Nov-79	1.89	1,534	82,519	67,925	9,409	1,300	1,190	174	987
Dec-79	-1.04	-907	86,471	72,740	11,399	984	1,094	174	987
Jan-80	9.72	7,862	88,783	65,944	10,781	1,154	1,835	178	1,029
Feb-80	4.61	3,749	85,072	65,409	11,991	1,051	1,665	178	1,029
Mar-80	-5.24	-4,435	80,276	69,505	11,381	1,140	1,478	178	1,029
Apr-80	-12.03	-10,519	76,900	71,896	11,777	1,156	1,346	183	1,062
May-80	-9.28	-8,061	78,814	71,353	11,905	973	1,399	183	1,062
Jun-80	-5.85	-4,828	77,709	67,423	11,011	1,501	1,357	183	1,062
Jul-80	8.90	6,749	82,569	61,020	10,856	1,551	1,094	186	1,113
Aug-80	11.79	8,976	85,084	59,632	12,300	1,424	1,454	186	1,113
Sep-80	14.29	10,738	85,873	58,386	12,576	1,421	1,453	186	1,113
Oct-80	5.98	4,814	85,304	62,717	13,787	1,246	1,411	189	1,140
Nov-80	5.63	4,714	88,388	64,999	14,579	1,212	1,556	189	1,140
Dec-80	6.92	5,751	88,895	64,899	13,890	1,548	1,480	189	1,140
Jan-81	4.51	3,773	87,508	65,108	13,875	1,163	2,196	198	1,196
Feb-81	-2.13	-1,818	83,703	66,529	15,108	1,529	960	198	1,196
Mar-81	-5.98	-5,157	81,024	67,290	15,176	1,007	1,314	198	1,196
Apr-81	-3.52	-3,069	84,219	67,206	15,247	1,341	2,039	207	1,247
May-81	3.32	2,762	85,891	64,372	14,613	1,259	1,430	207	1,247
Jun-81	0.73	619	85,377	63,620	17,162	1,115	1,407	207	1,247

MM/YR	NET RET. %	NET RET. $/LOT	REVEN. $/LOT	STEER COST $/LOT	FEED COST $/LOT	YARD COST $/LOT	TRT. COST $/LOT	PROC. COST $/LOT	MKT. COST $ /LOT
Jul-81	1.55	1,295	85,027	64,104	14,996	1,312	1,814	211	1,295
Aug-81	0.68	559	82,727	62,307	15,772	1,313	1,269	211	1,295
Sep-81	-3.77	-3,147	80,293	62,692	15,792	1,400	2,051	211	1,295
Oct-81	-6.38	-5,298	77,686	63,352	15,045	1,355	1,662	221	1,349
Nov-81	-4.59	-3,661	76,152	61,613	13,697	1,420	1,513	221	1,349
Dec-81	-3.45	-2,719	76,074	60,493	13,663	1,354	1,714	221	1,349
Jan-82	-4.45	-3,369	72,333	59,022	12,020	1,486	1,537	228	1,408
Feb-82	-0.15	-110	75,098	56,505	13,426	1,724	1,916	228	1,408
Mar-82	5.33	3,973	78,469	57,333	12,714	1,309	1,504	228	1,408
Apr-82	24.62	17,109	86,595	52,467	12,267	1,211	1,888	232	1,421
May-82	28.77	21,214	94,951	55,686	12,796	1,473	2,128	232	1,421
Jun-82	18.86	14,135	89,075	56,990	13,050	1,356	1,890	232	1,421
Jul-82	10.88	8,265	84,195	58,503	12,886	1,110	1,723	238	1,470
Aug-82	3.63	2,868	81,880	60,986	13,552	1,302	1,463	238	1,470
Sep-82	-0.88	-715	80,138	63,636	12,799	1,359	1,352	238	1,470
Oct-82	-0.17	-133	78,886	62,759	11,466	1,365	1,728	237	1,464
Nov-82	-4.05	-3,200	75,781	63,645	9,961	1,470	2,205	237	1,464
Dec-82	-6.17	-4,793	72,940	62,733	10,550	1,195	1,553	237	1,464
Jan-83	-1.23	-924	73,998	59,774	10,812	1,413	1,188	239	1,495
Feb-83	-1.42	-1,104	76,528	61,998	10,902	1,329	1,668	239	1,495
Mar-83	3.27	2,530	79,871	59,732	11,771	1,288	2,816	239	1,495
Apr-83	12.08	9,305	86,322	61,036	10,653	1,694	1,912	243	1,479
May-83	8.35	6,517	84,562	62,717	10,390	1,588	1,629	243	1,479
Jun-83	3.07	2,434	81,686	63,712	10,493	1,568	1,757	243	1,479
Jul-83	-1.58	-1,243	77,397	63,444	10,292	1,515	1,615	247	1,526
Aug-83	0.09	73	76,916	61,396	10,398	1,348	1,929	247	1,526
Sep-83	-4.52	-3,539	74,702	62,516	10,175	2,060	1,717	247	1,526
Oct-83	-0.54	-412	76,337	62,566	9,005	1,609	1,788	250	1,530
Nov-83	0.33	259	77,910	61,555	11,138	1,449	1,729	250	1,530
Dec-83	5.94	4,439	79,109	58,528	10,957	1,958	1,447	250	1,530
Jan-84	8.08	6,267	83,798	59,180	13,079	2,123	1,357	253	1,539
Feb-84	8.14	6,298	83,690	58,729	14,087	1,140	1,645	253	1,539
Mar-84	7.20	5,777	86,025	62,232	12,263	1,927	2,034	253	1,539
Apr-84	5.79	4,824	88,165	64,865	12,925	1,568	2,164	257	1,562
May-84	1.37	1,138	84,278	65,300	12,292	1,667	2,062	257	1,562
Jun-84	-1.61	-1,352	82,546	64,439	13,918	1,665	2,058	257	1,562
Jul-84	5.02	4,048	84,657	62,332	13,221	1,434	1,812	259	1,551
Aug-84	1.24	999	81,636	60,869	14,125	2,025	1,808	259	1,551
Sep-84	-1.62	-1,325	80,366	62,792	14,158	1,490	1,441	259	1,551
Oct-84	0.26	216	82,174	63,762	12,409	1,784	2,174	262	1,567
Nov-84	6.12	4,942	85,732	62,391	13,078	1,498	1,995	262	1,567
Dec-84	7.37	5,952	86,685	62,324	13,011	1,574	1,995	262	1,567
Jan-85	9.97	8,004	88,266	62,641	12,845	1,565	1,361	264	1,586
Feb-85	2.98	2,432	84,145	62,399	14,027	1,418	2,019	264	1,586
Mar-85	-0.23	-199	85,261	64,748	15,014	1,672	2,177	264	1,586
Apr-85	-0.09	-78	84,827	65,208	13,870	1,774	2,183	265	1,606
May-85	0.52	442	84,857	64,581	13,819	1,827	2,317	265	1,606
Jun-85	-3.69	-3,169	82,602	65,166	14,337	1,662	2,736	265	1,606
Jul-85	-8.19	-6,706	75,159	63,319	14,339	1,444	898	266	1,599
Aug-85	-12.98	-10,751	72,063	63,695	13,623	1,763	1,868	266	1,599
Sep-85	-7.05	-5,777	76,154	65,083	12,079	1,349	1,555	266	1,599
Oct-85	4.28	3,394	82,643	61,287	12,864	1,722	1,511	265	1,600
Nov-85	13.96	10,656	86,981	60,050	11,249	1,426	1,735	265	1,600
Dec-85	15.14	11,559	87,901	61,613	9,849	1,449	1,566	265	1,600

APPENDIX G - REAL REALIZED NET RETURNS

MM/YR	NET RET. %	NET RET. $/LOT	REVEN. $/LOT	STEER COST $/LOT	FEED COST $/LOT	YARD COST $/LOT	TRT. COST $/LOT	PROC. COST $/LOT	MKT. COST $/LOT
Jan-73	5.48	6,343	122,003	94,012	16,072	1,428	2,305	274	1,569
Feb-73	7.99	9,276	125,391	94,404	15,176	1,877	2,818	273	1,566
Mar-73	9.77	11,763	132,183	98,248	16,637	1,926	1,781	272	1,556
Apr-73	12.59	14,836	132,685	93,290	18,665	1,543	2,510	274	1,567
May-73	11.03	13,421	135,106	98,095	17,714	1,654	2,393	272	1,557
Jun-73	11.81	14,616	138,333	101,827	16,765	1,634	1,665	272	1,553
Jul-73	10.81	13,390	137,218	97,575	20,188	1,798	2,428	277	1,561
Aug-73	26.53	32,476	154,876	97,297	18,944	2,204	2,128	275	1,551
Sep-73	9.66	12,527	142,144	104,059	19,783	1,663	2,304	273	1,535
Oct-73	2.24	2,989	136,279	106,246	21,438	1,475	2,313	272	1,546
Nov-73	-8.42	-12,148	132,178	116,963	21,376	1,613	2,578	269	1,527
Dec-73	-8.91	-12,528	128,068	114,864	20,013	1,450	2,484	267	1,518
Jan-74	-0.21	-293	141,808	111,279	24,401	1,693	2,908	270	1,548
Feb-74	-2.63	-3,689	136,638	107,404	27,689	1,459	1,971	268	1,536
Mar-74	-10.07	-13,378	119,410	99,820	27,927	1,609	1,639	267	1,526
Apr-74	-12.69	-17,941	123,468	107,871	28,267	2,081	1,353	272	1,564
May-74	-8.24	-11,517	128,264	104,116	29,828	2,429	1,590	270	1,548
Jun-74	-4.32	-5,580	123,660	93,310	29,668	1,811	2,651	267	1,533
Jul-74	-5.78	-7,777	126,866	93,545	34,861	1,812	2,601	274	1,550
Aug-74	-1.46	-1,880	127,244	93,093	30,208	1,577	2,452	270	1,523
Sep-74	1.77	2,144	123,183	85,072	30,005	2,047	2,147	266	1,503
Oct-74	-5.56	-6,921	117,517	88,669	30,076	2,015	1,819	273	1,586
Nov-74	3.61	4,318	123,826	80,521	33,449	2,057	1,642	270	1,568
Dec-74	9.27	10,299	121,372	74,560	31,629	1,791	1,264	269	1,560
Jan-75	-5.63	-6,247	104,732	71,513	34,011	2,197	1,387	274	1,599
Feb-75	-19.54	-22,103	90,993	76,353	30,077	2,288	2,526	271	1,581
Mar-75	-20.96	-24,282	91,569	78,548	31,963	1,778	1,726	268	1,567
Apr-75	-14.10	-15,150	92,321	71,445	29,897	1,742	2,512	275	1,599
May-75	18.70	17,998	114,258	64,957	25,235	2,017	2,190	273	1,588
Jun-75	19.32	19,030	117,520	67,157	25,584	1,874	2,024	271	1,580
Jul-75	21.90	21,172	117,843	66,917	24,316	1,588	1,959	278	1,613
Aug-75	3.18	3,295	106,950	75,142	22,991	1,725	1,922	276	1,599
Sep-75	4.42	4,538	107,235	76,100	21,136	1,837	1,776	272	1,577
Oct-75	6.75	6,793	107,387	74,003	21,564	1,646	1,458	276	1,646
Nov-75	3.44	3,400	102,224	66,538	25,866	2,094	2,425	273	1,629
Dec-75	7.35	6,680	97,550	63,361	22,962	1,462	1,185	273	1,626
Jan-76	-7.90	-7,547	87,978	66,358	23,383	1,785	2,047	279	1,672
Feb-76	-3.16	-2,861	87,526	62,429	23,106	1,454	1,463	277	1,658
Mar-76	-7.51	-6,933	85,375	64,442	22,748	2,056	1,131	277	1,655
Apr-76	6.85	6,146	95,831	61,614	23,092	1,668	1,370	279	1,661
May-76	0.99	931	95,378	64,975	22,851	2,235	2,455	278	1,653
Jun-76	-4.28	-3,962	88,517	65,852	20,710	1,871	2,120	277	1,648
Jul-76	-12.08	-11,560	84,190	69,445	20,593	1,710	2,059	283	1,667
Aug-76	-13.92	-13,197	81,646	69,132	20,398	1,764	1,615	281	1,654
Sep-76	-10.07	-9,520	84,980	66,957	21,804	1,874	1,941	280	1,646
Oct-76	-7.41	-6,504	81,300	62,586	19,489	1,771	2,022	284	1,652
Nov-76	-2.68	-2,250	81,616	59,878	18,316	1,904	1,841	283	1,644
Dec-76	-5.85	-5,058	81,440	60,787	20,726	1,611	1,457	281	1,636

MM/YR	NET RET. %	NET RET. $/LOT	REVEN. $/LOT	STEER COST $/LOT	FEED COST $/LOT	YARD COST $/LOT	TRT. COST $/LOT	PROC. COST $/LOT	MKT. COST $/LOT
Jan-77	-1.85	-1,462	77,533	55,434	18,272	1,808	1,535	284	1,664
Feb-77	-1.75	-1,347	75,489	54,249	17,405	1,617	1,623	283	1,659
Mar-77	-0.66	-518	77,665	54,131	18,702	1,646	1,771	282	1,651
Apr-77	-1.05	-850	80,122	54,647	19,372	2,237	2,760	286	1,671
May-77	2.42	1,947	82,566	56,904	18,717	1,697	1,362	283	1,656
Jun-77	2.09	1,724	84,101	58,230	18,493	1,783	1,954	280	1,638
Jul-77	0.78	652	84,538	59,666	18,475	1,904	1,901	281	1,659
Aug-77	-0.20	-168	83,943	60,334	18,540	2,112	1,199	279	1,647
Sep-77	1.86	1,585	86,838	61,551	18,465	1,811	1,515	277	1,634
Oct-77	11.03	9,191	92,552	61,708	15,238	2,508	1,984	280	1,643
Nov-77	11.84	9,767	92,254	62,195	14,123	1,953	2,301	279	1,636
Dec-77	3.29	2,780	87,363	63,074	15,598	2,256	1,751	278	1,626
Jan-78	7.11	5,873	88,538	62,375	14,626	1,899	1,838	280	1,645
Feb-78	7.12	5,929	89,239	64,633	13,195	2,043	1,527	278	1,633
Mar-78	17.26	14,088	95,703	63,332	12,628	1,949	1,808	276	1,622
Apr-78	26.08	22,982	111,112	67,404	15,216	1,734	1,847	284	1,645
May-78	37.22	33,954	125,173	71,107	13,567	2,118	2,512	282	1,634
Jun-78	34.03	32,781	129,122	76,759	14,754	1,729	1,205	279	1,616
Jul-78	13.52	14,149	118,805	84,109	14,531	2,267	1,877	278	1,593
Aug-78	-0.43	-500	114,815	94,452	13,873	2,522	2,623	274	1,572
Sep-78	-0.76	-907	118,895	100,776	12,986	1,927	2,281	272	1,559
Oct-78	1.19	1,398	119,143	99,038	13,047	1,581	2,258	271	1,550
Nov-78	-0.38	-444	117,249	99,757	11,499	2,032	2,586	270	1,548
Dec-78	-4.00	-4,847	116,179	102,307	12,227	2,008	2,661	271	1,552
Jan-79	4.16	5,037	126,204	102,413	12,498	1,921	2,478	277	1,579
Feb-79	18.56	21,836	139,484	98,670	12,623	2,116	2,398	275	1,566
Mar-79	20.44	24,572	144,785	102,601	12,003	1,621	2,153	274	1,562
Apr-79	11.82	15,444	146,141	111,997	12,998	1,725	2,089	283	1,605
May-79	0.71	1,013	144,030	123,138	13,791	2,216	2,001	280	1,591
Jun-79	-4.70	-6,978	141,573	130,079	12,287	1,870	2,466	277	1,571
Jul-79	-7.72	-1,173	133,600	124,918	13,169	1,887	2,932	280	1,588
Aug-79	-8.06	-11,374	129,781	120,872	14,875	1,731	1,827	277	1,572
Sep-79	-5.88	-8,164	130,755	117,568	15,615	1,695	2,200	276	1,564
Oct-79	-2.78	-3,671	128,377	112,053	13,756	1,914	2,471	278	1,576
Nov-79	-0.67	-861	127,979	108,063	14,970	2,069	1,892	277	1,570
Dec-79	-3.28	-4,516	133,309	114,737	17,980	1,552	1,725	274	1,557
Jan-80	7.38	9,349	136,063	103,261	16,881	1,808	2,873	279	1,611
Feb-80	2.52	3,182	129,306	101,442	18,597	1,630	2,583	276	1,596
Mar-80	-7.55	-9,856	120,740	107,154	17,546	1,758	2,278	275	1,586
Apr-80	-14.17	-18,978	114,995	110,184	18,048	1,771	2,062	280	1,627
May-80	-11.76	-15,534	116,511	108,453	18,096	1,479	2,126	278	1,614
Jun-80	-8.51	-10,560	113,581	101,409	16,561	2,257	2,042	275	1,597
Jul-80	5.61	6,359	119,739	91,248	16,234	2,320	1,637	278	1,664
Aug-80	8.69	9,779	122,290	88,154	18,183	2,105	2,149	275	1,645
Sep-80	11.40	12,519	122,338	85,339	18,381	2,077	2,124	272	1,626
Oct-80	3.21	3,743	120,467	90,950	19,994	1,807	2,047	274	1,653
Nov-80	2.45	2,946	123,210	93,423	20,955	1,742	2,236	272	1,638
Dec-80	4.05	4,803	123,254	92,457	19,788	2,205	2,108	269	1,623
Jan-81	1.30	1,540	119,792	91,946	19,594	1,642	3,101	279	1,690
Feb-81	-4.89	-5,829	113,384	92,739	21,060	2,132	1,338	276	1,668
Mar-81	-9.29	-11,096	108,395	93,298	21,041	1,397	1,821	274	1,659
Apr-81	-6.48	-7,745	111,745	92,000	20,872	1,836	2,792	284	1,707
May-81	0.38	431	113,037	87,198	19,795	1,706	1,937	281	1,689
Jun-81	-2.49	-2,827	110,563	85,111	22,959	1,492	1,883	277	1,668

MM/YR	NET RET. %	NET RET. $/LOT	REVEN. $/LOT	STEER COST $/LOT	FEED COST $/LOT	YARD COST $/LOT	TRT. COST $/LOT	PROC. COST $/LOT	MKT. COST $/LOT
Jul-81	-1.68	-1,863	109,236	85,057	19,898	1,741	2,407	281	1,718
Aug-81	-2.49	-2,693	105,444	82,000	20,757	1,729	1,670	278	1,704
Sep-81	-5.93	-6,413	101,642	81,186	20,450	1,813	2,656	274	1,676
Oct-81	-8.65	-9,221	97,390	81,390	19,329	1,741	2,135	283	1,733
Nov-81	-6.97	-7,088	94,642	78,533	17,459	1,810	1,928	281	1,719
Dec-81	-5.66	-5,649	94,093	76,577	17,295	1,713	2,169	279	1,708
Jan-82	-6.35	-6,030	88,872	73,991	15,069	1,863	1,927	286	1,765
Feb-82	-2.49	-2,323	91,145	70,225	16,686	2,143	2,381	284	1,750
Mar-82	2.11	1,948	94,090	70,913	15,726	1,619	1,860	282	1,742
Apr-82	20.95	17,886	103,261	64,464	15,071	1,487	2,320	285	1,746
May-82	24.79	22,189	111,682	67,585	15,530	1,788	2,583	282	1,725
Jun-82	15.44	13,875	103,734	68,335	15,648	1,627	2,266	279	1,704
Jul-82	7.71	6,982	97,525	69,762	15,366	1,324	2,054	284	1,752
Aug-82	1.60	1,487	94,421	71,732	15,940	1,532	1,721	280	1,728
Sep-82	-2.38	-2,238	91,921	74,109	14,905	1,582	1,574	277	1,711
Oct-82	-1.75	-1,602	89,928	72,694	13,282	1,581	2,002	275	1,696
Nov-82	-5.81	-5,294	85,784	73,393	11,486	1,695	2,542	273	1,688
Dec-82	-7.40	-6,595	82,568	71,957	12,102	1,371	1,782	272	1,679
Jan-83	-1.67	-1,423	83,985	68,140	12,326	1,611	1,355	273	1,704
Feb-83	-1.59	-1,400	86,478	70,181	12,341	1,505	1,889	271	1,692
Mar-83	2.02	1,771	89,321	67,616	13,324	1,458	3,188	271	1,692
Apr-83	10.44	9,123	96,534	69,274	12,091	1,923	2,170	275	1,678
May-83	6.95	6,130	94,322	70,871	11,741	1,795	1,840	274	1,671
Jun-83	1.67	1,477	90,105	71,249	11,735	1,754	1,965	271	1,654
Jul-83	-3.33	-2,932	85,012	70,950	11,510	1,695	1,806	277	1,707
Aug-83	-1.93	-1,657	84,056	68,482	11,598	1,504	2,151	276	1,702
Sep-83	-5.41	-4,669	81,637	68,959	11,223	2,273	1,894	273	1,683
Oct-83	-1.62	-1,367	82,933	68,722	9,891	1,767	1,963	274	1,681
Nov-83	-0.26	-217	84,642	67,269	12,172	1,584	1,889	273	1,672
Dec-83	4.97	4,055	85,657	63,961	11,975	2,139	1,581	273	1,672
Jan-84	7.18	6,051	90,281	64,294	14,209	2,306	1,474	274	1,672
Feb-84	6.62	5,563	89,643	63,804	15,304	1,239	1,787	274	1,672
Mar-84	5.78	5,026	91,916	67,383	13,278	2,087	2,203	274	1,666
Apr-84	4.66	4,181	93,970	69,884	13,924	1,690	2,332	277	1,683
May-84	0.70	626	89,679	69,945	13,166	1,786	2,209	275	1,673
Jun-84	-2.42	-2,166	87,477	68,852	14,871	1,779	2,199	274	1,669
Jul-84	3.82	3,286	89,203	66,436	14,092	1,528	1,932	276	1,654
Aug-84	0.25	215	86,020	64,770	15,030	2,155	1,924	276	1,651
Sep-84	-2.26	-1,958	84,613	66,543	15,004	1,579	1,527	274	1,644
Oct-84	0.02	17	86,376	67,186	13,075	1,880	2,291	276	1,651
Nov-84	5.18	4,406	89,535	65,741	13,780	1,578	2,102	276	1,651
Dec-84	6.42	5,457	90,457	65,617	13,698	1,658	2,101	276	1,650
Jan-85	8.74	7,371	91,738	65,845	13,502	1,645	1,431	277	1,668
Feb-85	1.83	1,559	86,896	65,167	14,650	1,481	2,108	275	1,657
Mar-85	-1.50	-1,340	87,839	67,566	15,667	1,744	2,272	275	1,655
Apr-85	-1.36	-1,199	87,045	67,772	14,415	1,843	2,268	275	1,669
May-85	-0.35	-306	86,869	66,693	14,271	1,887	2,393	273	1,658
Jun-85	-4.83	-4,268	84,096	67,136	14,770	1,712	2,819	273	1,654
Jul-85	-9.20	-7,727	76,278	64,974	14,714	1,481	922	273	1,641
Aug-85	-13.87	-11,756	73,022	65,205	13,946	1,805	1,912	272	1,637
Sep-85	-7.63	-6,366	77,046	66,259	12,298	1,373	1,583	271	1,628
Oct-85	3.63	2,922	83,351	62,200	13,056	1,747	1,533	269	1,624
Nov-85	12.99	10,046	87,386	60,849	11,398	1,445	1,758	268	1,622
Dec-85	13.81	10,664	87,901	62,335	9,964	1,466	1,584	268	1,619

APPENDIX H - REALIZED REVENUE

NO. OF ANIMALS PURCHASED :	100
DEATH LOSS (% OF ANIMALS) :	0.4
NET SALES (# OF ANIMALS) :	99.6
SALE WEIGHT (KG) :	520
SHRINK PERCENTAGE :	4
NO. OF LOTS USED TO MEASURE GRADE DISCOUNT :	117
WTED REAL MEAN DISCOUNT ($/CWT) :	0.16
WTED REAL MEAN DISCOUNT ($/KG) :	0.0035

This table provides a time series of realized returns on the beef feedlot investment based on a set market weight of 520 kg and a shrink of four percent. The price series is based on direct to packer sales which is calculated as a proportion of auction market sales due to lack of data on direct to packer sales for this time period. There is a simulated variance of grade discounts included in the model.

MM/YR	MARKET WT (KG)	PRICE ($/CWT)	PRICE ($/KG)	WEIGHTED DISCOUNT ($/KG)	PRICE LESS DISCOUNT ($/KG)	REVENUE ($/LOT)
Jan-73	520	39.52	0.8693	0.0034	0.8659	43,054
Feb-73	520	40.80	0.8977	0.0019	0.8958	44,540
Mar-73	520	43.10	0.9483	0.0019	0.9464	47,055
Apr-73	520	43.65	0.9603	0.0000	0.9603	47,746
May-73	520	44.73	0.9841	0.0000	0.9841	48,930
Jun-73	520	46.29	1.0184	0.0000	1.0184	50,633
Jul-73	520	46.39	1.0206	0.0019	1.0187	50,649
Aug-73	520	52.92	1.1642	0.0000	1.1642	57,884
Sep-73	520	48.96	1.0771	0.0020	1.0751	53,455
Oct-73	520	46.95	1.0329	0.0000	1.0329	51,355
Nov-73	520	46.00	1.0120	0.0020	1.0100	50,217
Dec-73	520	44.75	0.9846	0.0000	0.9846	48,953
Jan-74	520	50.12	1.1027	0.0037	1.0990	54,643
Feb-74	520	48.91	1.0760	0.0064	1.0695	53,178
Mar-74	520	42.91	0.9440	0.0000	0.9440	46,934
Apr-74	520	44.72	0.9839	0.0021	0.9818	48,815
May-74	520	47.18	1.0379	0.0000	1.0379	51,603
Jun-74	520	46.09	1.0140	0.0000	1.0140	50,419
Jul-74	520	47.56	1.0463	0.0000	1.0463	52,020
Aug-74	520	48.24	1.0612	0.0000	1.0612	52,764
Sep-74	520	46.96	1.0331	0.0000	1.0331	51,366
Oct-74	520	45.36	0.9979	0.0032	0.9947	49,457
Nov-74	520	48.48	1.0667	0.0070	1.0596	52,686
Dec-74	520	47.74	1.0503	0.0023	1.0481	52,110
Jan-75	520	41.33	0.9093	0.0000	0.9093	45,209
Feb-75	520	36.17	0.7956	0.0000	0.7956	39,559
Mar-75	520	36.59	0.8049	0.0000	0.8049	40,021
Apr-75	520	37.33	0.8213	0.0054	0.8158	40,564
May-75	520	46.30	1.0186	0.0000	1.0186	50,644
Jun-75	520	48.54	1.0678	0.0055	1.0623	52,816
Jul-75	520	49.08	1.0798	0.0000	1.0798	53,689
Aug-75	520	45.07	0.9916	0.0016	0.9900	49,222
Sep-75	520	45.27	0.9959	0.0016	0.9943	49,436
Oct-75	520	45.82	1.0081	0.0025	1.0057	50,003
Nov-75	520	43.88	0.9653	0.0000	0.9653	47,994
Dec-75	520	42.05	0.9251	0.0025	0.9227	45,875
Jan-76	520	38.18	0.8399	0.0036	0.8362	41,577
Feb-76	520	38.00	0.8360	0.0000	0.8360	41,566
Mar-76	520	37.45	0.8240	0.0059	0.8181	40,677
Apr-76	520	42.02	0.9245	0.0017	0.9228	45,881
May-76	520	42.08	0.9258	0.0000	0.9258	46,032
Jun-76	520	39.41	0.8671	0.0037	0.8633	42,926
Jul-76	520	37.44	0.8238	0.0000	0.8238	40,957
Aug-76	520	36.48	0.8027	0.0000	0.8027	39,909
Sep-76	520	38.15	0.8394	0.0000	0.8394	41,736
Oct-76	520	36.73	0.8081	0.0000	0.8081	40,179
Nov-76	520	36.99	0.8138	0.0000	0.8138	40,461
Dec-76	520	37.08	0.8158	0.0000	0.8158	40,563

MM/YR	MARKET WT (KG)	PRICE ($/CWT)	PRICE ($/KG)	WEIGHTED DISCOUNT ($/KG)	PRICE LESS DISCOUNT ($/KG)	REVENUE ($/LOT)
Jan-77	520	35.58	0.7827	0.0000	0.7827	38,916
Feb-77	520	34.96	0.7691	0.0000	0.7691	38,240
Mar-77	520	36.35	0.7997	0.0000	0.7997	39,762
Apr-77	520	37.91	0.8340	0.0040	0.8300	41,268
May-77	520	39.35	0.8657	0.0040	0.8617	42,845
Jun-77	520	40.32	0.8870	0.0028	0.8843	43,966
Jul-77	520	40.85	0.8986	0.0019	0.8967	44,587
Aug-77	520	40.95	0.9009	0.0065	0.8943	44,467
Sep-77	520	42.30	0.9306	0.0000	0.9306	46,269
Oct-77	520	45.47	1.0004	0.0000	1.0004	49,742
Nov-77	520	45.78	1.0072	0.0029	1.0044	49,938
Dec-77	520	43.63	0.9598	0.0019	0.9579	47,628
Jan-78	520	44.44	0.9778	0.0042	0.9735	48,405
Feb-78	520	44.92	0.9882	0.0000	0.9882	49,133
Mar-78	520	48.85	1.0746	0.0029	1.0717	53,283
Apr-78	520	56.71	1.2477	0.0000	1.2477	62,034
May-78	520	65.02	1.4305	0.0055	1.4250	70,851
Jun-78	520	67.45	1.4840	0.0020	1.4820	73,684
Jul-78	520	63.04	1.3869	0.0031	1.3839	68,806
Aug-78	520	61.20	1.3463	0.0071	1.3392	66,584
Sep-78	520	62.87	1.3831	0.0000	1.3831	68,766
Oct-78	520	63.67	1.4007	0.0000	1.4007	69,646
Nov-78	520	63.15	1.3894	0.0000	1.3894	69,082
Dec-78	520	63.31	1.3928	0.0125	1.3803	68,631
Jan-79	520	68.69	1.5112	0.0000	1.5112	75,138
Feb-79	520	76.75	1.6886	0.0032	1.6854	83,798
Mar-79	520	80.64	1.7741	0.0021	1.7719	88,101
Apr-79	520	81.96	1.8031	0.0032	1.7999	89,490
May-79	520	81.44	1.7918	0.0000	1.7918	89,087
Jun-79	520	80.85	1.7786	0.0086	1.7700	88,005
Jul-79	520	76.64	1.6861	0.0033	1.6828	83,668
Aug-79	520	74.58	1.6407	0.0000	1.6407	81,577
Sep-79	520	76.39	1.6806	0.0134	1.6672	82,896
Oct-79	520	74.95	1.6489	0.0000	1.6489	81,983
Nov-79	520	75.85	1.6686	0.0089	1.6597	82,519
Dec-79	520	79.05	1.7391	0.0000	1.7391	86,471
Jan-80	520	81.17	1.7856	0.0000	1.7856	88,783
Feb-80	520	77.77	1.7110	0.0000	1.7110	85,072
Mar-80	520	73.89	1.6255	0.0110	1.6145	80,276
Apr-80	520	70.54	1.5518	0.0051	1.5467	76,900
May-80	520	72.05	1.5851	0.0000	1.5851	78,814
Jun-80	520	71.04	1.5629	0.0000	1.5629	77,709
Jul-80	520	75.48	1.6607	0.0000	1.6607	82,569
Aug-80	520	77.78	1.7112	0.0000	1.7112	85,084
Sep-80	520	78.51	1.7271	0.0000	1.7271	85,873
Oct-80	520	78.38	1.7244	0.0087	1.7157	85,304
Nov-80	520	80.80	1.7777	0.0000	1.7777	88,388
Dec-80	520	81.27	1.7879	0.0000	1.7879	88,895
Jan-81	520	80.18	1.7639	0.0039	1.7600	87,508
Feb-81	520	76.64	1.6861	0.0026	1.6835	83,703
Mar-81	520	74.07	1.6296	0.0000	1.6296	81,024
Apr-81	520	77.11	1.6965	0.0027	1.6939	84,219
May-81	520	78.86	1.7348	0.0074	1.7275	85,891
Jun-81	520	78.24	1.7212	0.0041	1.7171	85,377

MM/YR	MARKET WT (KG)	PRICE ($/CWT)	PRICE ($/KG)	WEIGHTED DISCOUNT ($/KG)	PRICE LESS DISCOUNT ($/KG)	REVENUE ($/LOT)
Jul-81	520	77.73	1.7101	0.0000	1.7101	85,027
Aug-81	520	75.63	1.6638	0.0000	1.6638	82,727
Sep-81	520	73.68	1.6210	0.0061	1.6149	80,293
Oct-81	520	71.02	1.5625	0.0000	1.5625	77,686
Nov-81	520	69.62	1.5316	0.0000	1.5316	76,152
Dec-81	520	69.55	1.5300	0.0000	1.5300	76,074
Jan-82	520	66.13	1.4548	0.0000	1.4548	72,333
Feb-82	520	68.65	1.5104	0.0000	1.5104	75,098
Mar-82	520	71.94	1.5826	0.0044	1.5782	78,469
Apr-82	520	79.17	1.7416	0.0000	1.7416	86,595
May-82	520	86.80	1.9097	0.0000	1.9097	94,951
Jun-82	520	81.43	1.7915	0.0000	1.7915	89,075
Jul-82	520	77.18	1.6979	0.0046	1.6934	84,195
Aug-82	520	74.86	1.6468	0.0000	1.6468	81,880
Sep-82	520	73.26	1.6118	0.0000	1.6118	80,138
Oct-82	520	72.12	1.5866	0.0000	1.5866	78,886
Nov-82	520	69.94	1.5387	0.0146	1.5241	75,781
Dec-82	520	66.68	1.4670	0.0000	1.4670	72,940
Jan-83	520	68.04	1.4968	0.0085	1.4883	73,998
Feb-83	520	69.96	1.5392	0.0000	1.5392	76,528
Mar-83	520	73.02	1.6064	0.0000	1.6064	79,871
Apr-83	520	79.13	1.7409	0.0047	1.7361	86,322
May-83	520	77.31	1.7007	0.0000	1.7007	84,562
Jun-83	520	74.68	1.6429	0.0000	1.6429	81,686
Jul-83	520	70.76	1.5566	0.0000	1.5566	77,397
Aug-83	520	70.32	1.5470	0.0000	1.5470	76,916
Sep-83	520	68.29	1.5024	0.0000	1.5024	74,702
Oct-83	520	70.30	1.5467	0.0113	1.5353	76,337
Nov-83	520	71.45	1.5718	0.0049	1.5670	77,910
Dec-83	520	72.32	1.5911	0.0000	1.5911	79,109
Jan-84	520	76.61	1.6854	0.0000	1.6854	83,798
Feb-84	520	76.84	1.6904	0.0072	1.6832	83,690
Mar-84	520	79.06	1.7392	0.0091	1.7302	86,025
Apr-84	520	80.60	1.7732	0.0000	1.7732	88,165
May-84	520	77.64	1.7081	0.0130	1.6950	84,278
Jun-84	520	75.46	1.6602	0.0000	1.6602	82,546
Jul-84	520	77.39	1.7027	0.0000	1.7027	84,657
Aug-84	520	74.63	1.6419	0.0000	1.6419	81,636
Sep-84	520	73.47	1.6164	0.0000	1.6164	80,366
Oct-84	520	75.12	1.6527	0.0000	1.6527	82,174
Nov-84	520	78.38	1.7243	0.0000	1.7243	85,732
Dec-84	520	79.85	1.7567	0.0133	1.7434	86,685
Jan-85	520	80.69	1.7753	0.0000	1.7753	88,266
Feb-85	520	76.93	1.6924	0.0000	1.6924	84,145
Mar-85	520	77.95	1.7148	0.0000	1.7148	85,261
Apr-85	520	77.55	1.7061	0.0000	1.7061	84,827
May-85	520	78.12	1.7187	0.0120	1.7067	84,857
Jun-85	520	75.52	1.6613	0.0000	1.6613	82,602
Jul-85	520	68.71	1.5116	0.0000	1.5116	75,159
Aug-85	520	66.12	1.4546	0.0052	1.4494	72,063
Sep-85	520	69.97	1.5393	0.0076	1.5316	76,154
Oct-85	520	75.71	1.6656	0.0035	1.6622	82,643
Nov-85	520	79.52	1.7494	0.0000	1.7494	86,981
Dec-85	520	80.36	1.7679	0.0000	1.7679	87,901

APPENDIX I - REALIZED STEER COSTS

PURCHASE WEIGHT OF STEERS (KG) :	380
NO. OF STEERS PURCHASED :	100

This table lists the time series of realized steer costs based on a constant purchase weight of 100 steers at 380 kg. The price series used is the Edmonton Stockyard prices for good steers.

MM/YR	PURCHASE WT (KG)	PRICE ($/CWT)	PRICE ($/KG)	STEER COST ($)
Oct-72	380	38.99	0.8578	32,596
Nov-72	380	39.24	0.8633	32,805
Dec-72	380	41.11	0.9044	34,368
Jan-73	380	39.38	0.8664	32,922
Feb-73	380	41.68	0.9170	34,844
Mar-73	380	43.36	0.9539	36,249
Apr-73	380	42.00	0.9240	35,112
May-73	380	42.15	0.9273	35,237
Jun-73	380	45.56	1.0023	38,088
Jul-73	380	46.91	1.0320	39,217
Aug-73	380	52.29	1.1504	43,714
Sep-73	380	51.67	1.1367	43,196
Oct-73	380	50.16	1.1035	41,934
Nov-73	380	48.81	1.0738	40,805
Dec-73	380	45.64	1.0041	38,155
Jan-74	380	49.72	1.0938	41,566
Feb-74	380	48.47	1.0663	40,521
Mar-74	380	43.87	0.9651	36,675
Apr-74	380	44.24	0.9733	36,985
May-74	380	44.80	0.9856	37,453
Jun-74	380	41.49	0.9128	34,686
Jul-74	380	43.49	0.9568	36,358
Aug-74	380	39.94	0.8787	33,390
Sep-74	380	37.19	0.8182	31,091
Oct-74	380	36.00	0.7920	30,096
Nov-74	380	38.86	0.8549	32,487
Dec-74	380	40.34	0.8875	33,724
Jan-75	380	36.89	0.8116	30,840
Feb-75	380	33.78	0.7432	28,240
Mar-75	380	35.11	0.7724	29,352
Apr-75	380	35.17	0.7737	29,402
May-75	380	39.84	0.8765	33,306
Jun-75	380	40.91	0.9000	34,201
Jul-75	380	40.33	0.8873	33,716
Aug-75	380	36.63	0.8059	30,623
Sep-75	380	34.94	0.7687	29,210
Oct-75	380	36.96	0.8131	30,899
Nov-75	380	35.06	0.7713	29,310
Dec-75	380	36.25	0.7975	30,305
Jan-76	380	34.83	0.7663	29,118
Feb-76	380	36.91	0.8120	30,857
Mar-76	380	37.53	0.8257	31,375
Apr-76	380	39.77	0.8749	33,248
May-76	380	39.91	0.8780	33,365
Jun-76	380	38.84	0.8545	32,470
Jul-76	380	36.42	0.8012	30,447
Aug-76	380	35.01	0.7702	29,268
Sep-76	380	35.71	0.7856	29,854
Oct-76	380	32.77	0.7209	27,396
Nov-76	380	32.17	0.7077	26,894
Dec-76	380	32.25	0.7095	26,961

MM/YR	PURCHASE WT (KG)	PRICE ($/CWT)	PRICE ($/KG)	STEER COST ($)
Jan-77	380	32.81	0.7218	27,429
Feb-77	380	34.48	0.7586	28,825
Mar-77	380	35.66	0.7845	29,812
Apr-77	380	36.76	0.8087	30,731
May-77	380	37.45	0.8239	31,308
Jun-77	380	38.49	0.8468	32,178
Jul-77	380	38.93	0.8565	32,545
Aug-77	380	39.41	0.8670	32,947
Sep-77	380	40.20	0.8844	33,607
Oct-77	380	40.10	0.8822	33,524
Nov-77	380	41.85	0.9207	34,987
Dec-77	380	41.30	0.9086	34,527
Jan-78	380	44.08	0.9698	36,851
Feb-78	380	46.83	1.0303	39,150
Mar-78	380	51.12	1.1246	42,736
Apr-78	380	56.17	1.2357	46,958
May-78	380	63.95	1.4069	53,462
Jun-78	380	68.79	1.5134	57,508
Jul-78	380	68.61	1.5094	57,358
Aug-78	380	69.20	1.5224	57,851
Sep-78	380	70.78	1.5572	59,172
Oct-78	380	71.61	1.5754	59,866
Nov-78	380	69.54	1.5299	58,135
Dec-78	380	72.50	1.5950	60,610
Jan-79	380	79.76	1.7547	66,679
Feb-79	380	88.49	1.9468	73,978
Mar-79	380	94.68	2.0830	79,152
Apr-79	380	91.50	2.0130	76,494
May-79	380	89.43	1.9675	74,763
Jun-79	380	87.42	1.9232	73,083
Jul-79	380	83.94	1.8467	70,174
Aug-79	380	81.25	1.7875	67,925
Sep-79	380	87.01	1.9142	72,740
Oct-79	380	78.88	1.7354	65,944
Nov-79	380	78.24	1.7213	65,409
Dec-79	380	83.14	1.8291	69,505
Jan-80	380	86.00	1.8920	71,896
Feb-80	380	85.35	1.8777	71,353
Mar-80	380	80.65	1.7743	67,423
Apr-80	380	72.99	1.6058	61,020
May-80	380	71.33	1.5693	59,632
Jun-80	380	69.84	1.5365	58,386
Jul-80	380	75.02	1.6504	62,717
Aug-80	380	77.75	1.7105	64,999
Sep-80	380	77.63	1.7079	64,899
Oct-80	380	77.88	1.7134	65,108
Nov-80	380	79.58	1.7508	66,529
Dec-80	380	80.49	1.7708	67,290
Jan-81	380	80.39	1.7686	67,206
Feb-81	380	77.00	1.6940	64,372
Mar-81	380	76.10	1.6742	63,620
Apr-81	380	76.68	1.6870	64,104
May-81	380	74.53	1.6397	62,307
Jun-81	380	74.99	1.6498	62,692

MM/YR	PURCHASE WT (KG)	PRICE ($/CWT)	PRICE ($/KG)	STEER COST ($)
Jul-81	380	75.78	1.6672	63,352
Aug-81	380	73.70	1.6214	61,613
Sep-81	380	72.36	1.5919	60,493
Oct-81	380	70.60	1.5532	59,022
Nov-81	380	67.59	1.4870	56,505
Dec-81	380	68.58	1.5088	57,333
Jan-82	380	62.76	1.3807	52,467
Feb-82	380	66.61	1.4654	55,686
Mar-82	380	68.17	1.4997	56,990
Apr-82	380	69.98	1.5396	58,503
May-82	380	72.95	1.6049	60,986
Jun-82	380	76.12	1.6746	63,636
Jul-82	380	75.07	1.6515	62,759
Aug-82	380	76.13	1.6749	63,645
Sep-82	380	75.04	1.6509	62,733
Oct-82	380	71.50	1.5730	59,774
Nov-82	380	74.16	1.6315	61,998
Dec-82	380	71.45	1.5719	59,732
Jan-83	380	73.01	1.6062	61,036
Feb-83	380	75.02	1.6504	62,717
Mar-83	380	76.21	1.6766	63,712
Apr-83	380	75.89	1.6696	63,444
May-83	380	73.44	1.6157	61,396
Jun-83	380	74.78	1.6452	62,516
Jul-83	380	74.84	1.6465	62,566
Aug-83	380	73.63	1.6199	61,555
Sep-83	380	70.01	1.5402	58,528
Oct-83	380	70.79	1.5574	59,180
Nov-83	380	70.25	1.5455	58,729
Dec-83	380	74.44	1.6377	62,232
Jan-84	380	77.59	1.7070	64,865
Feb-84	380	78.11	1.7184	65,300
Mar-84	380	77.08	1.6958	64,439
Apr-84	380	74.56	1.6403	62,332
May-84	380	72.81	1.6018	60,869
Jun-84	380	75.11	1.6524	62,792
Jul-84	380	76.27	1.6779	63,762
Aug-84	380	74.63	1.6419	62,391
Sep-84	380	74.55	1.6401	62,324
Oct-84	380	74.93	1.6485	62,641
Nov-84	380	74.64	1.6421	62,399
Dec-84	380	77.45	1.7039	64,748
Jan-85	380	78.00	1.7160	65,208
Feb-85	380	77.25	1.6995	64,581
Mar-85	380	77.95	1.7149	65,166
Apr-85	380	75.74	1.6663	63,319
May-85	380	76.19	1.6762	63,695
Jun-85	380	77.85	1.7127	65,083
Jul-85	380	73.31	1.6128	61,287
Aug-85	380	71.83	1.5803	60,050
Sep-85	380	73.70	1.6214	61,613
Oct-85	380	76.20	1.6764	63,703
Nov-85	380	77.24	1.6993	64,573
Dec-85	380	79.40	1.7468	66,378

APPENDIX J - REALIZED FEED COSTS

NO. OF ANIMALS PURCHASED :	100
DEATH LOSS (% OF ANIMALS) :	0.4
% OF FEED CONSUMED BY THE ANIMALS THAT DIE :	25
NO. OF ANIMALS FED :	99.7
FEED CONVERSION -- MEAN (KG) :	7.102
-- S.D. (KG) :	0.33
-- VAR. (KG) :	0.1089
TOTAL GAIN PER ANIMAL (KG) :	140
TOTAL FEED REQ. -- MEAN (KG/LOT) :	99,130
--- S.D. (KG) :	4,606
--- VAR. (KG) :	21,216,526
FACTOR TRANSFORMING BARLEY PRICE TO TOTAL FEED PRICE :	1.082
BARLEY FREIGHT - 1988 ($/T) :	6.50
FEED PROCESSING - 1984 ($/T) :	11.05
% OF F.I.P.I. USED TO ADJUST BARLEY FREIGHT ---- FUEL :	33
---- M.V. MAIN. :	67

This table provides a time series of feed costs using a barley based ration with a time series of prices based on barley prices. Feed consumption is based on industry estimates with a simulated variance included.

MM/YR	RLZED TOTAL FEED REQ. (KG)	BARL. ($/T)	FEED TRNS $/T	FEED COST $/T	TOT. INI. FEED COST $/LOT	FEED ADJ. $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOT. FEED COST $/LOT
Oct-72	96,928	47.90	2.24	54.25	5,378	-134	4.01	328	5,573
Nov-72	92,246	47.90	2.24	54.25	5,378	-419	4.01	315	5,274
Dec-72	100,714	47.90	2.24	54.25	5,378	96	4.01	345	5,820
Jan-73	100,720	54.92	2.28	61.89	6,135	104	4.08	348	6,587
Feb-73	96,397	54.92	2.28	61.89	6,135	-179	4.08	336	6,292
Mar-73	91,635	54.92	2.28	61.89	6,135	-490	4.08	323	5,968
Apr-73	102,978	59.39	2.30	66.75	6,617	282	4.21	366	7,265
May-73	97,705	59.39	2.30	66.75	6,617	-104	4.21	348	6,861
Jun-73	102,662	59.39	2.30	66.75	6,617	258	4.21	366	7,241
Jul-73	100,587	66.74	2.34	74.75	7,410	144	4.24	360	7,913
Aug-73	101,317	66.74	2.34	74.75	7,410	216	4.24	364	7,989
Sep-73	96,766	66.74	2.34	74.75	7,410	-233	4.24	349	7,526
Oct-73	88,771	91.00	2.41	101.07	10,019	-1,146	4.30	322	9,195
Nov-73	100,335	91.00	2.41	101.07	10,019	133	4.30	367	10,520
Dec-73	101,659	91.00	2.41	101.07	10,019	280	4.30	376	10,675
Jan-74	93,063	102.34	2.49	113.42	11,244	-699	4.43	348	10,892
Feb-74	99,054	102.34	2.49	113.42	11,244	-9	4.43	374	11,609
Mar-74	99,461	102.34	2.49	113.42	11,244	38	4.43	379	11,661
Apr-74	112,476	106.97	2.51	118.46	11,743	1,607	4.58	433	13,783
May-74	99,326	106.97	2.51	118.46	11,743	24	4.58	387	12,153
Jun-74	99,939	106.97	2.51	118.46	11,743	97	4.58	394	12,234
Jul-74	96,407	111.92	2.70	124.02	12,294	-345	4.73	384	12,332
Aug-74	108,123	111.92	2.70	124.02	12,294	1,142	4.73	435	13,870
Sep-74	102,893	111.92	2.70	124.02	12,294	478	4.73	417	13,189
Oct-74	106,497	117.99	2.80	130.69	12,955	922	4.86	436	14,314
Nov-74	94,226	117.99	2.80	130.69	12,955	-548	4.86	390	12,797
Dec-74	102,401	117.99	2.80	130.69	12,955	340	4.86	428	13,723
Jan-75	96,533	116.07	2.87	128.69	12,757	-259	5.01	408	12,906
Feb-75	91,200	103.02	2.87	114.57	11,357	-776	5.01	389	10,971
Mar-75	101,242	95.46	2.87	106.39	10,547	199	5.01	436	11,182
Apr-75	100,262	91.55	2.94	102.24	10,135	113	5.16	437	10,684
May-75	97,648	89.68	2.94	100.21	9,934	-173	5.16	429	10,191
Jun-75	94,462	86.18	2.94	96.43	9,559	-479	5.16	419	9,499
Jul-75	92,330	91.02	3.15	101.89	10,100	-689	5.31	413	9,825
Aug-75	95,532	107.21	3.15	119.41	11,837	-365	5.31	432	11,904
Sep-75	96,293	94.12	3.15	105.25	10,433	-288	5.31	441	10,586
Oct-75	100,273	92.82	3.28	103.97	10,307	117	5.49	464	10,888
Nov-75	99,819	92.90	3.28	104.06	10,316	68	5.49	464	10,848
Dec-75	98,273	92.97	3.28	104.14	10,323	-85	5.49	459	10,698
Jan-76	99,639	93.62	3.29	104.86	10,395	50	5.58	468	10,913
Feb-76	102,034	90.72	3.29	101.72	10,084	285	5.58	483	10,852
Mar-76	92,256	90.88	3.29	101.90	10,101	-674	5.58	441	9,867
Apr-76	92,762	90.06	3.33	101.05	10,017	-605	5.72	447	9,859
May-76	92,574	89.75	3.33	100.72	9,984	-589	5.72	449	9,845
Jun-76	100,249	89.81	3.33	100.78	9,991	94	5.72	489	10,573
Jul-76	91,424	86.91	3.34	97.65	9,680	-648	5.83	449	9,481
Aug-76	91,282	81.90	3.34	92.23	9,142	-640	5.83	451	8,953
Sep-76	112,038	76.04	3.34	85.89	8,514	1,109	5.83	556	10,179
Oct-76	98,875	76.37	3.43	86.34	8,559	-22	5.92	494	9,030
Nov-76	97,347	73.93	3.43	83.70	8,297	-158	5.92	490	8,629
Dec-76	100,047	77.94	3.43	88.04	8,727	81	5.92	507	9,315

MM/YR	RLZED TOTAL FEED REQ. (KG)	BARL. ($/T)	FEED TRNS $/T	FEED COST $/T	TOT. INI. FEED COST $/LOT	FEED ADJ. $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOT. FEED COST $/LOT
Jan-77	101,945	79.95	3.49	90.29	8,950	253	6.05	520	9,723
Feb-77	98,926	80.36	3.49	90.73	8,994	-19	6.05	506	9,482
Mar-77	99,182	79.99	3.49	90.33	8,954	5	6.05	509	9,468
Apr-77	97,749	81.45	3.57	92.00	9,120	-107	6.11	504	9,516
May-77	95,639	83.72	3.57	94.45	9,363	-238	6.11	496	9,621
Jun-77	104,294	78.01	3.57	88.27	8,751	357	6.11	545	9,653
Jul-77	94,291	69.75	3.61	79.38	7,869	-329	6.24	497	8,036
Aug-77	99,555	60.94	3.61	69.84	6,924	30	6.24	528	7,481
Sep-77	109,453	61.77	3.61	70.74	7,013	714	6.24	584	8,311
Oct-77	104,816	60.54	3.69	69.49	6,889	409	6.36	563	7,861
Nov-77	92,975	62.34	3.69	71.44	7,082	-443	6.36	504	7,143
Dec-77	90,566	61.72	3.69	70.77	7,015	-627	6.36	495	6,884
Jan-78	105,088	64.31	3.73	73.62	7,298	441	6.55	580	8,319
Feb-78	94,299	64.34	3.73	73.65	7,301	-352	6.55	520	7,470
Mar-78	102,418	65.50	3.73	74.91	7,426	223	6.55	565	8,214
Apr-78	99,906	66.36	3.67	75.77	7,511	50	6.55	551	8,113
May-78	97,587	65.39	3.67	74.72	7,407	-96	6.55	541	7,852
Jun-78	98.546	60.65	3.67	69.60	6,899	-36	6.55	548	7,411
Jul-78	105,823	57.18	3.70	65.87	6,530	436	6.62	590	7,556
Aug-78	96,439	55.03	3.70	63.55	6,299	-174	6.62	543	6,669
Sep-78	102,578	54.71	3.70	63.20	6,265	222	6.62	584	7,072
Oct-78	100,358	58.18	3.80	67.06	6,647	81	6.84	578	7,306
Nov-78	102,466	57.84	3.80	66.69	6,611	229	6.84	597	7,437
Dec-78	98,035	57.62	3.80	66.45	6,587	-76	6.84	579	7,090
Jan-79	104,169	58.95	3.93	68.03	6,744	372	7.10	623	7,739
Feb-79	107,154	61.52	3.93	70.81	7,020	621	7.10	645	8,285
Mar-79	97,166	61.81	3.93	71.13	7,051	-162	7.10	588	7,477
Apr-79	98,146	66.37	3.99	76.13	7,547	-81	7.24	598	8,064
May-79	106,227	69.80	3.99	79.84	7,915	636	7.24	650	9,201
Jun-79	105,412	74.83	3.99	85.28	8,454	605	7.24	648	9,707
Jul-79	95,210	74.38	4.05	84.86	8,412	-385	7.34	588	8,615
Aug-79	95,636	81.49	4.05	92.56	9,175	-360	7.34	595	9,409
Sep-79	107,400	87.89	4.05	99.48	9,862	865	7.34	673	11,399
Oct-79	99,487	90.03	4.26	102.02	10,113	39	7.53	629	10,781
Nov-79	106,018	94.70	4.26	107.07	10,614	702	7.53	675	11,991
Dec-79	98,997	96.05	4.26	108.53	10,759	-13	7.53	636	11,381
Jan-80	98,518	100.03	4.41	113.00	11,202	-63	7.71	637	11,777
Feb-80	105,835	93.30	4.41	105.72	10,480	737	7.71	688	11,905
Mar-80	98,281	93.19	4.41	105.60	10,469	-101	7.71	644	11,011
Apr-80	96,373	93.95	4.68	106.72	10,579	-359	7.85	635	10,856
May-80	101,850	100.46	4.68	113.77	11,278	347	7.85	676	12,300
Jun-80	96,685	109.50	4.68	123.55	12,247	-317	7.85	646	12,576
Jul-80	97,842	119.21	4.81	134.19	13,302	-172	7.98	657	13,787
Aug-80	104,942	116.68	4.81	131.45	13,031	833	7.98	715	14,579
Sep-80	98,806	118.75	4.81	133.69	13,253	-46	7.98	683	13,890
Oct-80	95,868	122.32	5.06	137.82	13,662	-459	8.35	671	13,875
Nov-80	96,991	132.13	5.06	148.44	14,715	-296	8.35	689	15,108
Dec-80	96,792	132.95	5.06	149.33	14,803	-325	8.35	699	15,176

MM/YR	RLZED TOTAL FEED REQ. (KG)	BARL. ($/T)	FEED TRNS $/T	FEED COST $/T	TOT. INI. FEED COST $/LOT	FEED ADJ. $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOT. FEED COST $/LOT
Jan-81	98,719	130.69	5.26	147.09	14,581	-58	8.75	724	15,247
Feb-81	96,112	128.37	5.26	144.58	14,333	-429	8.75	709	14,613
Mar-81	113,470	129.07	5.26	145.34	14,408	1,912	8.75	842	17,162
Apr-81	96,007	131.50	5.50	148.24	14,694	-415	8.93	717	14,996
May-81	101,017	132.19	5.50	148.98	14,769	239	8.93	765	15,772
Jun-81	108,859	123.76	5.50	139.86	13,864	1,093	8.93	835	15,792
Jul-81	102,486	123.53	5.73	139.86	13,864	383	9.31	797	15,045
Aug-81	96,527	117.61	5.73	133.45	13,229	-292	9.31	760	13,697
Sep-81	108,645	103.44	5.73	118.12	11,709	1,086	9.31	867	13,663
Oct-81	93,914	104.77	6.00	119.86	11,881	-620	9.64	759	12,020
Nov-81	107,023	102.29	6.00	117.17	11,615	941	9.64	870	13,426
Dec-81	99,941	104.06	6.00	119.09	11,805	92	9.64	817	12,714
Jan-82	92,624	108.33	6.04	123.75	12,267	-762	9.80	761	12,267
Feb-82	96,481	108.75	6.04	124.20	12,312	-316	9.80	800	12,796
Mar-82	103,100	103.27	6.04	118.27	11,724	464	9.80	862	13,050
Apr-82	98,709	106.55	6.27	122.07	12,100	-45	10.05	831	12,886
May-82	102,796	108.66	6.27	124.35	12,327	361	10.05	865	13,552
Jun-82	97,561	106.75	6.27	122.28	12,122	-143	10.05	820	12,799
Jul-82	93,539	97.90	6.24	112.68	11,170	-490	10.01	786	11,466
Aug-82	89,320	88.43	6.24	102.44	10,155	-947	10.01	753	9,961
Sep-82	102,356	81.09	6.24	94.50	9,367	316	10.01	867	10,550
Oct-82	108,370	77.40	6.40	90.67	8,989	903	10.11	921	10,812
Nov-82	100,706	85.83	6.40	99.80	9,893	150	10.11	860	10,902
Dec-82	107,830	87.21	6.40	101.29	10,041	804	10.11	925	11,771
Jan-83	97,241	86.84	6.27	100.75	9,987	-172	10.24	838	10,653
Feb-83	97,524	84.08	6.27	97.76	9,691	-147	10.24	847	10,390
Mar-83	101,045	81.76	6.27	95.25	9,442	168	10.24	883	10,493
Apr-83	100,353	80.26	6.51	93.88	9,306	103	10.45	883	10,292
May-83	100,627	80.79	6.51	94.45	9,363	147	10.45	888	10,398
Jun-83	102,019	77.08	6.51	90.44	8,965	306	10.45	903	10,175
Jul-83	95,201	73.86	6.50	86.95	8,620	-460	10.55	845	9,005
Aug-83	101,255	86.60	6.50	100.74	9,986	250	10.55	902	11,138
Sep-83	93,250	94.33	6.50	109.10	10,815	-692	10.55	834	10,957
Oct-83	101,133	104.74	6.52	120.39	11,934	237	10.67	908	13,079
Nov-83	109,023	105.13	6.52	120.81	11,976	1,127	10.67	984	14,087
Dec-83	94,114	105.41	6.52	121.11	12,006	-597	10.67	854	12,263
Jan-84	98,721	105.94	6.62	121.79	12,073	-49	10.84	901	12,925
Feb-84	97,400	101.72	6.62	117.22	11,620	-219	10.84	891	12,292
Mar-84	105,509	106.71	6.62	122.62	12,155	795	10.84	968	13,918
Apr-84	99,805	107.47	6.53	123.35	12,227	76	10.93	918	13,221
May-84	101,067	114.35	6.53	130.79	12,965	227	10.93	932	14,125
Jun-84	103,004	112.35	6.53	128.63	12,751	454	10.93	953	14,158
Jul-84	98,355	101.44	6.59	116.89	11,588	-93	11.05	914	12,409
Aug-84	100,165	105.43	6.59	121.21	12,015	130	11.05	933	13,078
Sep-84	99,666	105.39	6.59	121.17	12,011	69	11.05	931	13,011
Oct-84	96,829	107.37	6.69	123.41	12,234	-295	11.12	907	12,845
Nov-84	101,359	112.57	6.69	129.04	12,792	285	11.12	951	14,027
Dec-84	106,153	115.55	6.69	132.26	13,111	905	11.12	997	15,014

MM/YR	RLZED TOTAL FEED REQ. (KG)	BARL. ($/T)	FEED TRNS $/T	FEED COST $/T	TOT. INI. FEED COST $/LOT	FEED ADJ. $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOT. FEED COST $/LOT
Jan-85	98,077	115.22	6.79	132.02	13,087	-139	11.18	923	13,870
Feb-85	97,968	114.84	6.79	131.61	13,046	-150	11.18	923	13,819
Mar-85	100,884	115.98	6.79	132.84	13,168	216	11.18	952	14,337
Apr-85	98,300	119.22	6.74	136.29	13,510	-101	11.22	929	14,339
May-85	95,327	115.82	6.74	132.61	13,146	-423	11.22	900	13,623
Jun-85	87,084	110.14	6.74	126.47	12,537	-1,279	11.22	821	12,079
Jul-85	95,342	108.66	6.76	124.89	12,380	-414	11.18	898	12,864
Aug-85	90,504	98.83	6.76	114.25	11,326	-935	11.18	859	11,249
Sep-85*	97,472	94.01	6.76	109.03	9,069	-149	11.18	929	9,849
Oct-85*	N/A	94.14	6.80	109.21	N/A	N/A	11.23	N/A	N/A
Nov-85*	N/A	93.43	6.80	108.45	N/A	N/A	11.23	N/A	N/A
Dec-85*	N/A	92.79	6.80	107.75	N/A	N/A	11.23	N/A	N/A

* CBOP reduction of $21 per tonne of barley fed during these months.

** N/A = Not Applicable

APPENDIX K - REALIZED YARDAGE COSTS

O --- STRAW USED (KG/HEAD/DAY) :	0.91
D --- AVERAGE DAILY GAIN -- MEAN (KG/DAY) :	1.48
--- VAR. (KG/DAY) :	0.036
E --- NO. OF ANIMALS FED :	99.7
INDEX PROPORTION FOR YARDAGE ---- SUPPLIES & SERVICES :	100
INDEX PROPORTIO FOR BEDDING --- LEGUME AND GRASS :	100
TOTAL GAIN (KG) :	140
YARDAGE COST AS OF JULY, 1987 ($/HEAD/DAY) :	0.15
BEDDING COST AS OF JULY, 1987 ($/HEAD/DAY) :	0.04

This table provides a time series of yardage costs based on daily yardage costs and bedding costs. A simulation of ADG variance is included which allows for variance in the days on feed.

MM/YR	TOT. YARD. ($/LOT)	SAMPLE ADG	YARDAGE ($/HD/DAY)	BEDDING ($/HD/DAY)
Oct-72	495	1.7164	0.053	0.009
Nov-72	652	1.3028	0.053	0.009
Dec-72	674	1.2613	0.053	0.009
Jan-73	545	1.6457	0.054	0.012
Feb-73	588	1.5246	0.054	0.012
Mar-73	582	1.5394	0.054	0.012
Apr-73	647	1.4253	0.055	0.012
May-73	798	1.1553	0.055	0.012
Jun-73	609	1.5149	0.055	0.012
Jul-73	544	1.7019	0.056	0.012
Aug-73	603	1.5368	0.056	0.012
Sep-73	545	1.6986	0.056	0.012
Oct-73	638	1.4700	0.057	0.012
Nov-73	554	1.6917	0.057	0.012
Dec-73	615	1.5243	0.057	0.012
Jan-74	802	1.3601	0.058	0.022
Feb-74	945	1.1533	0.058	0.022
Mar-74	712	1.5311	0.058	0.022
Apr-74	716	1.5614	0.060	0.023
May-74	635	1.7619	0.060	0.023
Jun-74	834	1.3398	0.060	0.023
Jul-74	826	1.3871	0.062	0.023
Aug-74	853	1.3440	0.062	0.023
Sep-74	747	1.5352	0.062	0.023
Oct-74	925	1.2654	0.064	0.023
Nov-74	974	1.2021	0.064	0.023
Dec-74	764	1.5338	0.064	0.023
Jan-75	752	1.5494	0.066	0.020
Feb-75	877	1.3284	0.066	0.020
Mar-75	819	1.4222	0.066	0.020
Apr-75	698	1.7119	0.068	0.020
May-75	765	1.5620	0.068	0.020
Jun-75	826	1.4466	0.068	0.020
Jul-75	750	1.6279	0.070	0.020
Aug-75	964	1.2663	0.070	0.020
Sep-75	674	1.8109	0.070	0.020
Oct-75	831	1.5079	0.072	0.020
Nov-75	683	1.8364	0.072	0.020
Dec-75	967	1.2966	0.072	0.020
Jan-76	788	1.5790	0.073	0.018
Feb-76	1,061	1.1729	0.073	0.018
Mar-76	892	1.3962	0.073	0.018
Apr-76	819	1.5513	0.075	0.018
May-76	851	1.4917	0.075	0.018
Jun-76	909	1.3976	0.075	0.018
Jul-76	861	1.4976	0.077	0.018
Aug-76	931	1.3860	0.077	0.018
Sep-76	791	1.6313	0.077	0.018
Oct-76	893	1.4635	0.078	0.018
Nov-76	801	1.6317	0.078	0.018
Dec-76	820	1.5959	0.078	0.018

MM/YR	TOT. YARD. ($/LOT)	SAMPLE ADG	YARDAGE ($/HD/DAY)	BEDDING ($/HD/DAY)
Jan-77	1,123	1.2723	0.080	0.026
Feb-77	860	1.6615	0.080	0.026
Mar-77	913	1.5650	0.080	0.026
Apr-77	981	1.4679	0.080	0.026
May-77	1,096	1.3134	0.080	0.026
Jun-77	947	1.5202	0.080	0.026
Jul-77	1,323	1.1072	0.082	0.026
Aug-77	1,034	1.4159	0.082	0.026
Sep-77	1,202	1.2183	0.082	0.026
Oct-77	1,021	1.4564	0.084	0.026
Nov-77	1,106	1.3438	0.084	0.026
Dec-77	1,062	1.3990	0.084	0.026
Jan-78	948	1.6020	0.086	0.026
Feb-78	1,166	1.3024	0.086	0.026
Mar-78	963	1.5771	0.086	0.026
Apr-78	1,266	1.1994	0.086	0.026
May-78	1,427	1.0638	0.086	0.026
Jun-78	1,100	1.3800	0.086	0.026
Jul-78	916	1.6714	0.087	0.026
Aug-78	1,179	1.2980	0.087	0.026
Sep-78	1,162	1.3166	0.087	0.026
Oct-78	1,123	1.3973	0.090	0.026
Nov-78	1,247	1.2581	0.090	0.026
Dec-78	957	1.6384	0.090	0.026
Jan-79	1,027	1.5869	0.094	0.027
Feb-79	1,331	1.2240	0.094	0.027
Mar-79	1,138	1.4318	0.094	0.027
Apr-79	1,155	1.4321	0.095	0.027
May-79	1,071	1.5449	0.095	0.027
Jun-79	1,054	1.5697	0.095	0.027
Jul-79	1,199	1.3946	0.097	0.027
Aug-79	1,300	1.2846	0.097	0.027
Sep-79	984	1.6969	0.097	0.027
Oct-79	1,154	1.4748	0.099	0.027
Nov-79	1,051	1.6195	0.099	0.027
Dec-79	1,140	1.4932	0.099	0.027
Jan-80	1,156	1.5095	0.102	0.028
Feb-80	973	1.7916	0.102	0.028
Mar-80	1,501	1.1631	0.102	0.028
Apr-80	1,551	1.1400	0.103	0.027
May-80	1,424	1.2426	0.103	0.027
Jun-80	1,421	1.2453	0.103	0.027
Jul-80	1,246	1.4405	0.105	0.027
Aug-80	1,212	1.4809	0.105	0.027
Sep-80	1,548	1.1584	0.105	0.027
Oct-80	1,163	1.5984	0.110	0.027
Nov-80	1,529	1.2138	0.110	0.027
Dec-80	1,007	1.8426	0.110	0.027
Jan-81	1,341	1.4442	0.115	0.028
Feb-81	1,259	1.5384	0.115	0.028
Mar-81	1,115	1.7357	0.115	0.028
Apr-81	1,312	1.4997	0.118	0.028
May-81	1,313	1.4970	0.118	0.028
Jun-81	1,400	1.4034	0.118	0.028

MM/YR	TOT. YARD. (\$/LOT)	SAMPLE ADG	YARDAGE (\$/HD/DAY)	BEDDING (\$/HD/DAY)
Jul-81	1,355	1.5009	0.123	0.028
Aug-81	1,420	1.4338	0.123	0.028
Sep-81	1,354	1.5067	0.123	0.028
Oct-81	1,486	1.4160	0.127	0.029
Nov-81	1,724	1.2211	0.127	0.029
Dec-81	1,309	1.6084	0.127	0.029
Jan-82	1,211	1.7064	0.129	0.023
Feb-82	1,473	1.4020	0.129	0.023
Mar-82	1,356	1.5228	0.129	0.023
Apr-82	1,110	1.8857	0.132	0.022
May-82	1,302	1.6080	0.132	0.022
Jun-82	1,359	1.5429	0.132	0.022
Jul-82	1,365	1.5307	0.132	0.022
Aug-82	1,470	1.4228	0.132	0.022
Sep-82	1,195	1.7507	0.132	0.022
Oct-82	1,413	1.5077	0.133	0.023
Nov-82	1,329	1.6038	0.133	0.023
Dec-82	1,288	1.6551	0.133	0.023
Jan-83	1,694	1.3030	0.135	0.027
Feb-83	1,588	1.3899	0.135	0.027
Mar-83	1,568	1.4080	0.135	0.027
Apr-83	1,515	1.4930	0.138	0.029
May-83	1,348	1.6783	0.138	0.029
Jun-83	2,060	1.0981	0.138	0.029
Jul-83	1,609	1.4177	0.139	0.029
Aug-83	1,449	1.5739	0.139	0.029
Sep-83	1,958	1.1650	0.139	0.029
Oct-83	2,123	1.0779	0.140	0.027
Nov-83	1,140	2.0069	0.140	0.027
Dec-83	1,927	1.1873	0.140	0.027
Jan-84	1,568	1.4822	0.143	0.028
Feb-84	1,667	1.3940	0.143	0.028
Mar-84	1,665	1.3955	0.143	0.028
Apr-84	1,434	1.6302	0.144	0.028
May-84	2,025	1.1533	0.144	0.028
Jun-84	1,490	1.5677	0.144	0.028
Jul-84	1,784	1.3216	0.146	0.028
Aug-84	1,498	1.5746	0.146	0.028
Sep-84	1,574	1.4983	0.146	0.028
Oct-84	1,565	1.5172	0.147	0.028
Nov-84	1,418	1.6745	0.147	0.028
Dec-84	1,672	1.4204	0.147	0.028
Jan-85	1,774	1.3454	0.147	0.028
Feb-85	1,827	1.3068	0.147	0.028
Mar-85	1,662	1.4372	0.147	0.028
Apr-85	1,444	1.6547	0.148	0.027
May-85	1,763	1.3548	0.148	0.027
Jun-85	1,349	1.7714	0.148	0.027
Jul-85	1,722	1.3830	0.147	0.027
Aug-85	1,426	1.6784	0.147	0.027
Sep-85	1,449	1.6566	0.147	0.027

APPENDIX L - REALIZED TREATMENT COSTS

Zo --- NO. OF ANIMALS TREATED : 100
I.T.P. PREMIUM RATE (%) : 1

This table provides a time series of realized treatment costs based on treatment costs per animal and an ITP premium. The treatment cost per animal includes a simulated variance.

MM/YR	TOT. TRTMT COSTS ($/LOT)	TRTMT COST PER ANIMAL ($)	I.T.P. PREMIUM ($/LOT)	S.D. IN TREATMENT ($/LOT)
Oct-72	799	4.25	326	138
Nov-72	979	4.25	328	138
Dec-72	623	4.25	344	138
Jan-73	886	4.33	329	140
Feb-73	850	4.33	348	140
Mar-73	593	4.33	362	140
Apr-73	874	4.46	351	145
May-73	771	4.46	352	145
Jun-73	843	4.46	381	145
Jul-73	854	4.49	392	146
Aug-73	963	4.49	437	146
Sep-73	934	4.49	432	146
Oct-73	1,096	4.56	419	148
Nov-73	749	4.56	408	148
Dec-73	626	4.56	382	148
Jan-74	521	4.70	416	152
Feb-74	619	4.70	405	152
Mar-74	1,042	4.70	367	152
Apr-74	1,028	4.85	370	157
May-74	986	4.85	375	157
Jun-74	875	4.85	347	157
Jul-74	746	5.02	364	163
Aug-74	681	5.02	334	163
Sep-74	527	5.02	311	163
Oct-74	584	5.15	301	167
Nov-74	1,075	5.15	325	167
Dec-74	741	5.15	337	167
Jan-75	1,084	5.31	308	172
Feb-75	952	5.31	282	172
Mar-75	885	5.31	294	172
Apr-75	861	5.47	294	177
May-75	852	5.47	333	177
Jun-75	798	5.47	342	177
Jul-75	664	5.63	337	183
Aug-75	1,116	5.63	306	183
Sep-75	546	5.63	292	183
Oct-75	953	5.82	309	189
Nov-75	687	5.82	293	189
Dec-75	532	5.82	303	189
Jan-76	647	5.91	291	192
Feb-76	1,166	5.91	309	192
Mar-76	1,010	5.91	314	192
Apr-76	986	6.07	332	197
May-76	779	6.07	334	197
Jun-76	941	6.07	325	197
Jul-76	984	6.18	304	200
Aug-76	900	6.18	293	200
Sep-76	716	6.18	299	200
Oct-76	758	6.28	274	204
Nov-76	805	6.28	269	204
Dec-76	882	6.28	270	204

MM/YR	TOT. TRTMT COSTS ($/LOT)	TRTMT COST PER ANIMAL ($)	I.T.P. PREMIUM ($/LOT)	S.D. IN TREATMENT ($/LOT)
Jan-77	1,385	6.42	274	208
Feb-77	690	6.42	288	208
Mar-77	1,000	6.42	298	208
Apr-77	979	6.47	307	210
May-77	622	6.47	313	210
Jun-77	792	6.47	322	210
Jul-77	1,046	6.62	325	215
Aug-77	1,219	6.62	329	215
Sep-77	933	6.62	336	215
Oct-77	988	6.75	335	219
Nov-77	827	6.75	350	219
Dec-77	986	6.75	345	219
Jan-78	1,010	6.94	369	225
Feb-78	1,383	6.94	391	225
Mar-78	671	6.94	427	225
Apr-78	1,048	6.94	470	225
May-78	1,485	6.94	535	225
Jun-78	1,302	6.94	575	225
Jul-78	1,308	7.02	574	228
Aug-78	1,500	7.02	579	228
Sep-78	1,539	7.02	592	228
Oct-78	1,449	7.25	599	235
Nov-78	1,413	7.25	581	235
Dec-78	1,272	7.25	606	235
Jan-79	1,244	7.53	667	244
Feb-79	1,202	7.53	740	244
Mar-79	1,501	7.53	792	244
Apr-79	1,795	7.68	765	249
May-79	1,130	7.68	748	249
Jun-79	1,368	7.68	731	249
Jul-79	1,547	7.78	702	252
Aug-79	1,190	7.78	679	252
Sep-79	1,094	7.78	727	252
Oct-79	1,835	7.98	659	259
Nov-79	1,665	7.98	654	259
Dec-79	1,478	7.98	695	259
Jan-80	1,346	8.17	719	265
Feb-80	1,399	8.17	714	265
Mar-80	1,357	8.17	674	265
Apr-80	1,094	8.32	610	270
May-80	1,454	8.32	596	270
Jun-80	1,453	8.32	584	270
Jul-80	1,411	8.46	627	274
Aug-80	1,556	8.46	650	274
Sep-80	1,480	8.46	649	274
Oct-80	2,196	8.85	651	287
Nov-80	960	8.85	665	287
Dec-80	1,314	8.85	673	287
Jan-81	2,039	9.28	672	301
Feb-81	1,430	9.28	644	301
Mar-81	1,407	9.28	636	301
Apr-81	1,814	9.46	641	307
May-81	1,269	9.46	623	307
Jun-81	2,051	9.46	627	307

MM/YR	TOT. TRTMT COSTS ($/LOT)	TRTMT COST PER ANIMAL ($)	I.T.P. PREMIUM ($/LOT)	S.D. IN TREATMENT ($/LOT)
Jul-81	1,662	9.87	634	320
Aug-81	1,513	9.87	616	320
Sep-81	1,714	9.87	605	320
Oct-81	1,537	10.22	590	331
Nov-81	1,916	10.22	565	331
Dec-81	1,504	10.22	573	331
Jan-82	1,888	10.40	525	337
Feb-82	2,128	10.40	557	337
Mar-82	1,890	10.40	570	337
Apr-82	1,723	10.66	585	346
May-82	1,463	10.66	610	346
Jun-82	1,352	10.66	636	346
Jul-82	1,728	10.61	628	344
Aug-82	2,205	10.61	636	344
Sep-82	1,553	10.61	627	344
Oct-82	1,188	10.72	598	347
Nov-82	1,668	10.72	620	347
Dec-82	2,816	10.72	597	347
Jan-83	1,912	10.86	610	352
Feb-83	1,629	10.86	627	352
Mar-83	1,757	10.86	637	352
Apr-83	1,615	11.07	634	359
May-83	1,929	11.07	614	359
Jun-83	1,717	11.07	625	359
Jul-83	1,788	11.18	626	363
Aug-83	1,729	11.18	616	363
Sep-83	1,447	11.18	585	363
Oct-83	1,357	11.31	592	367
Nov-83	1,645	11.31	587	367
Dec-83	2,034	11.31	622	367
Jan-84	2,164	11.49	649	373
Feb-84	2,062	11.49	653	373
Mar-84	2,058	11.49	644	373
Apr-84	1,812	11.59	623	376
May-84	1,808	11.59	609	376
Jun-84	1,441	11.59	628	376
Jul-84	2,174	11.72	638	380
Aug-84	1,995	11.72	624	380
Sep-84	1,995	11.72	623	380
Oct-84	1,361	11.79	626	382
Nov-84	2,019	11.79	624	382
Dec-84	2,177	11.79	647	382
Jan-85	2,183	11.85	652	384
Feb-85	2,317	11.85	646	384
Mar-85	2,736	11.85	652	384
Apr-85	898	11.90	633	386
May-85	1,868	11.90	637	386
Jun-85	1,555	11.90	651	386
Jul-85	1,511	11.85	613	384
Aug-85	1,735	11.85	600	384
Sep-85	1,566	11.85	616	384

APPENDIX M - I.T.P. PREMIUMS

MM/YR	VALUE OF FEEDERS ($/LOT)	PREMIUM RATE (%)	I.T.P. PREMIUM ($/LOT)
Oct-72	32,596	0.01	326
Nov-72	32,805	0.01	328
Dec-72	34,368	0.01	344
Jan-73	32,922	0.01	329
Feb-73	34,844	0.01	348
Mar-73	36,249	0.01	362
Apr-73	35,112	0.01	351
May-73	35,237	0.01	352
Jun-73	38,088	0.01	381
Jul-73	39,217	0.01	392
Aug-73	43,714	0.01	437
Sep-73	43,196	0.01	432
Oct-73	41,934	0.01	419
Nov-73	40,805	0.01	408
Dec-73	38,155	0.01	382
Jan-74	41,566	0.01	416
Feb-74	40,521	0.01	405
Mar-74	36,675	0.01	367
Apr-74	36,985	0.01	370
May-74	37,453	0.01	375
Jun-74	34,686	0.01	347
Jul-74	36,358	0.01	364
Aug-74	33,390	0.01	334
Sep-74	31,091	0.01	311
Oct-74	30,096	0.01	301
Nov-74	32,487	0.01	325
Dec-74	33,724	0.01	337
Jan-75	30,840	0.01	308
Feb-75	28,240	0.01	282
Mar-75	29,352	0.01	294
Apr-75	29,402	0.01	294
May-75	33,306	0.01	333
Jun-75	34,201	0.01	342
Jul-75	33,716	0.01	337
Aug-75	30,623	0.01	306
Sep-75	29,210	0.01	292
Oct-75	30,899	0.01	309
Nov-75	29,310	0.01	293
Dec-75	30,305	0.01	303
Jan-76	29,118	0.01	291
Feb-76	30,857	0.01	309
Mar-76	31,375	0.01	314
Apr-76	33,248	0.01	332
May-76	33,365	0.01	334
Jun-76	32,470	0.01	325
Jul-76	30,447	0.01	304
Aug-76	29,268	0.01	293
Sep-76	29,854	0.01	299
Oct-76	27,396	0.01	274
Nov-76	26,894	0.01	269
Dec-76	26,961	0.01	270

MM/YR	VALUE OF FEEDERS ($/LOT)	PREMIUM RATE (%)	I.T.P. PREMIUM ($/LOT)
Jan-77	27,429	0.01	274
Feb-77	28,825	0.01	288
Mar-77	29,812	0.01	298
Apr-77	30,731	0.01	307
May-77	31,308	0.01	313
Jun-77	32,178	0.01	322
Jul-77	32,545	0.01	325
Aug-77	32,947	0.01	329
Sep-77	33,607	0.01	336
Oct-77	33,524	0.01	335
Nov-77	34,987	0.01	350
Dec-77	34,527	0.01	345
Jan-78	36,851	0.01	369
Feb-78	39,150	0.01	391
Mar-78	42,736	0.01	427
Apr-78	46,958	0.01	470
May-78	53,462	0.01	535
Jun-78	57,508	0.01	575
Jul-78	57,358	0.01	574
Aug-78	57,851	0.01	579
Sep-78	59,172	0.01	592
Oct-78	59,866	0.01	599
Nov-78	58,135	0.01	581
Dec-78	60,610	0.01	606
Jan-79	66,679	0.01	667
Feb-79	73,978	0.01	740
Mar-79	79,152	0.01	792
Apr-79	76,494	0.01	765
May-79	74,763	0.01	748
Jun-79	73,083	0.01	731
Jul-79	70,174	0.01	702
Aug-79	67,925	0.01	679
Sep-79	72,740	0.01	727
Oct-79	65,944	0.01	659
Nov-79	65,409	0.01	654
Dec-79	69,505	0.01	695
Jan-80	71,896	0.01	719
Feb-80	71,353	0.01	714
Mar-80	67,423	0.01	674
Apr-80	61,020	0.01	610
May-80	59,632	0.01	596
Jun-80	58,386	0.01	584
Jul-80	62,717	0.01	627
Aug-80	64,999	0.01	650
Sep-80	64,899	0.01	649
Oct-80	65,108	0.01	651
Nov-80	66,529	0.01	665
Dec-80	67,290	0.01	673

MM/YR	VALUE OF FEEDERS ($/LOT)	PREMIUM RATE (%)	I.T.P. PREMIUM ($/LOT)
Jan-81	67,206	0.01	672
Feb-81	64,372	0.01	644
Mar-81	63,620	0.01	636
Apr-81	64,104	0.01	641
May-81	62,307	0.01	623
Jun-81	62,692	0.01	627
Jul-81	63,352	0.01	634
Aug-81	61,613	0.01	616
Sep-81	60,493	0.01	605
Oct-81	59,022	0.01	590
Nov-81	56,505	0.01	565
Dec-81	57,333	0.01	573
Jan-82	52,467	0.01	525
Feb-82	55,686	0.01	557
Mar-82	56,990	0.01	570
Apr-82	58,503	0.01	585
May-82	60,986	0.01	610
Jun-82	63,636	0.01	636
Jul-82	62,759	0.01	628
Aug-82	63,645	0.01	636
Sep-82	62,733	0.01	627
Oct-82	59,774	0.01	598
Nov-82	61,998	0.01	620
Dec-82	59,732	0.01	597
Jan-83	61,036	0.01	610
Feb-83	62,717	0.01	627
Mar-83	63,712	0.01	637
Apr-83	63,444	0.01	634
May-83	61,396	0.01	614
Jun-83	62,516	0.01	625
Jul-83	62,566	0.01	626
Aug-83	61,555	0.01	616
Sep-83	58,528	0.01	585
Oct-83	59,180	0.01	592
Nov-83	58,729	0.01	587
Dec-83	62,232	0.01	622
Jan-84	64,865	0.01	649
Feb-84	65,300	0.01	653
Mar-84	64,439	0.01	644
Apr-84	62,332	0.01	623
May-84	60,869	0.01	609
Jun-84	62,792	0.01	628
Jul-84	63,762	0.01	638
Aug-84	62,391	0.01	624
Sep-84	62,324	0.01	623
Oct-84	62,641	0.01	626
Nov-84	62,399	0.01	624
Dec-84	64,748	0.01	647

MM/YR	VALUE OF FEEDERS ($/LOT)	PREMIUM RATE (%)	I.T.P. PREMIUM ($/LOT)
Jan-85	65,208	0.01	652
Feb-85	64,581	0.01	646
Mar-85	65,166	0.01	652
Apr-85	63,319	0.01	633
May-85	63,695	0.01	637
Jun-85	65,083	0.01	651
Jul-85	61,287	0.01	613
Aug-85	60,050	0.01	600
Sep-85	61,613	0.01	616

APPENDIX N - REALIZED PROCESSING COSTS

Zo -- NO. OF ANIMALS PURCHASED : 100

PROCESSING COST PER ANIMAL IN 1988 DOLLARS
($/ANIMAL) : 2.75

This table provides a time series of realized processing costs based on a processing cost per animal entering the feedlot.

MM/YR	TOTAL COST PROCESSING ($/LOT)	PROC. COST ($/HD)
Oct-72	95	0.9499
Nov-72	95	0.9499
Dec-72	95	0.9499
Jan-73	97	0.9673
Feb-73	97	0.9673
Mar-73	97	0.9673
Apr-73	100	0.9976
May-73	100	0.9976
Jun-73	100	0.9976
Jul-73	100	1.0041
Aug-73	100	1.0041
Sep-73	100	1.0041
Oct-73	102	1.0193
Nov-73	102	1.0193
Dec-73	102	1.0193
Jan-74	105	1.0497
Feb-74	105	1.0497
Mar-74	105	1.0497
Apr-74	108	1.0844
May-74	108	1.0844
Jun-74	108	1.0844
Jul-74	112	1.1213
Aug-74	112	1.1213
Sep-74	112	1.1213
Oct-74	115	1.1516
Nov-74	115	1.1516
Dec-74	115	1.1516
Jan-75	119	1.1863
Feb-75	119	1.1863
Mar-75	119	1.1863
Apr-75	122	1.2232
May-75	122	1.2232
Jun-75	122	1.2232
Jul-75	126	1.2579
Aug-75	126	1.2579
Sep-75	126	1.2579
Oct-75	130	1.3013
Nov-75	130	1.3013
Dec-75	130	1.3013
Jan-76	132	1.3208
Feb-76	132	1.3208
Mar-76	132	1.3208
Apr-76	136	1.3555
May-76	136	1.3555
Jun-76	136	1.3555
Jul-76	138	1.3815
Aug-76	138	1.3815
Sep-76	138	1.3815
Oct-76	140	1.4032
Nov-76	140	1.4032
Dec-76	140	1.4032

MM/YR	TOTAL COST PROCESSING ($/LOT)	PROC. COST ($/HD)
Jan-77	143	1.4336
Feb-77	143	1.4336
Mar-77	143	1.4336
Apr-77	145	1.4466
May-77	145	1.4466
Jun-77	145	1.4466
Jul-77	148	1.4791
Aug-77	148	1.4791
Sep-77	148	1.4791
Oct-77	151	1.5073
Nov-77	151	1.5073
Dec-77	151	1.5073
Jan-78	155	1.5507
Feb-78	155	1.5507
Mar-78	155	1.5507
Apr-78	155	1.5507
May-78	155	1.5507
Jun-78	155	1.5507
Jul-78	157	1.5680
Aug-78	157	1.5680
Sep-78	157	1.5680
Oct-78	162	1.6201
Nov-78	162	1.6201
Dec-78	162	1.6201
Jan-79	168	1.6830
Feb-79	168	1.6830
Mar-79	168	1.6830
Apr-79	172	1.7155
May-79	172	1.7155
Jun-79	172	1.7155
Jul-79	174	1.7394
Aug-79	174	1.7394
Sep-79	174	1.7394
Oct-79	178	1.7827
Nov-79	178	1.7827
Dec-79	178	1.7827
Jan-80	183	1.8261
Feb-80	183	1.8261
Mar-80	183	1.8261
Apr-80	186	1.8586
May-80	186	1.8586
Jun-80	186	1.8586
Jul-80	189	1.8912
Aug-80	189	1.8912
Sep-80	189	1.8912
Oct-80	198	1.9779
Nov-80	198	1.9779
Dec-80	198	1.9779
Jan-81	207	2.0733
Feb-81	207	2.0733
Mar-81	207	2.0733
Apr-81	211	2.1146

MM/YR	TOTAL COST PROCESSING ($/LOT)	PROC. COST ($/HD)
May-81	211	2.1146
Jun-81	211	2.1146
Jul-81	221	2.2056
Aug-81	221	2.2056
Sep-81	221	2.2056
Oct-81	228	2.2837
Nov-81	228	2.2837
Dec-81	228	2.2837
Jan-82	232	2.3228
Feb-82	232	2.3228
Mar-82	232	2.3228
Apr-82	238	2.3813
May-82	238	2.3813
Jun-82	238	2.3813
Jul-82	237	2.3705
Aug-82	237	2.3705
Sep-82	237	2.3705
Oct-82	239	2.3943
Nov-82	239	2.3943
Dec-82	239	2.3943
Jan-83	243	2.4269
Feb-83	243	2.4269
Mar-83	243	2.4269
Apr-83	247	2.4746
May-83	247	2.4746
Jun-83	247	2.4746
Jul-83	250	2.4984
Aug-83	250	2.4984
Sep-83	250	2.4984
Oct-83	253	2.5266
Nov-83	253	2.5266
Dec-83	253	2.5266
Jan-84	257	2.5678
Feb-84	257	2.5678
Mar-84	257	2.5678
Apr-84	259	2.5895
May-84	259	2.5895
Jun-84	259	2.5895
Jul-84	262	2.6177
Aug-84	262	2.6177
Sep-84	262	2.6177
Oct-84	264	2.6351
Nov-84	264	2.6351
Dec-84	264	2.6351
Jan-85	265	2.6481
Feb-85	265	2.6481
Mar-85	265	2.6481
Apr-85	266	2.6589
May-85	266	2.6589
Jun-85	266	2.6589
Jul-85	265	2.6481
Aug-85	265	2.6481
Sep-85	265	2.6481

APPENDIX O - REALIZED MARKETING COSTS

COST OF HAULING PURCHASES IN 1987 DOLLARS ($/LOT) :	1050
BUYER'S COMMISSION IN 1987 DOLLARS ($/HEAD) :	5.00
Zo -- NO. OF ANIMALS PURCHASED :	100
PURCHASE WEIGHT (KG) :	380
Wt -- TOTAL WT. OF ANIMALS PURCHASED (KG/LOT) :	38,000
% OF F.I.P.I. IN TRUCKING --- FUEL :	33
--- M.V. MAIN. :	67

This table provides a time series of realized marketing costs which includes a commission for cattle buyers and the cost of hauling the animals to the feedlot. The marketing costs associated with selling animals are subtracted from revenue.

MM/YR	BUYER'S COMM. ($/LOT)	HAULING PURCH. ($/LOT)	TOT. MKT. COSTS ($/LOT)
Oct-72	176	368	544
Nov-72	176	368	544
Dec-72	176	368	544
Jan-73	179	374	553
Feb-73	179	374	553
Mar-73	179	374	553
Apr-73	185	377	562
May-73	185	377	562
Jun-73	185	377	562
Jul-73	186	385	571
Aug-73	186	385	571
Sep-73	186	385	571
Oct-73	189	395	583
Nov-73	189	395	583
Dec-73	189	395	583
Jan-74	195	408	603
Feb-74	195	408	603
Mar-74	195	408	603
Apr-74	201	412	613
May-74	201	412	613
Jun-74	201	412	613
Jul-74	208	443	650
Aug-74	208	443	650
Sep-74	208	443	650
Oct-74	213	459	673
Nov-74	213	459	673
Dec-74	213	459	673
Jan-75	220	471	690
Feb-75	220	471	690
Mar-75	220	471	690
Apr-75	227	482	709
May-75	227	482	709
Jun-75	227	482	709
Jul-75	233	517	750
Aug-75	233	517	750
Sep-75	233	517	750
Oct-75	241	537	778
Nov-75	241	537	778
Dec-75	241	537	778
Jan-76	245	540	785
Feb-76	245	540	785
Mar-76	245	540	785
Apr-76	251	547	798
May-76	251	547	798
Jun-76	251	547	798
Jul-76	256	548	804
Aug-76	256	548	804
Sep-76	256	548	804
Oct-76	260	562	822
Nov-76	260	562	822
Dec-76	260	562	822

MM/YR	BUYER'S COMM. ($/LOT)	HAULING PURCH. ($/LOT)	TOT. MKT. COSTS ($/LOT)
Jan-77	266	573	839
Feb-77	266	573	839
Mar-77	266	573	839
Apr-77	268	586	854
May-77	268	586	854
Jun-77	268	586	854
Jul-77	274	593	867
Aug-77	274	593	867
Sep-77	274	593	867
Oct-77	279	605	884
Nov-77	279	605	884
Dec-77	279	605	884
Jan-78	287	612	900
Feb-78	287	612	900
Mar-78	287	612	900
Apr-78	287	602	890
May-78	287	602	890
Jun-78	287	602	890
Jul-78	291	607	898
Aug-78	291	607	898
Sep-78	291	607	898
Oct-78	300	623	923
Nov-78	300	623	923
Dec-78	300	623	923
Jan-79	312	644	956
Feb-79	312	644	956
Mar-79	312	644	956
Apr-79	318	655	972
May-79	318	655	972
Jun-79	318	655	972
Jul-79	322	665	987
Aug-79	322	665	987
Sep-79	322	665	987
Oct-79	330	698	1,029
Nov-79	330	698	1,029
Dec-79	330	698	1,029
Jan-80	338	723	1,062
Feb-80	338	723	1,062
Mar-80	338	723	1,062
Apr-80	344	768	1,113
May-80	344	768	1,113
Jun-80	344	768	1,113
Jul-80	350	789	1,140
Aug-80	350	789	1,140
Sep-80	350	789	1,140
Oct-80	367	830	1,196
Nov-80	367	830	1,196
Dec-80	367	830	1,196
Jan-81	384	863	1,247
Feb-81	384	863	1,247
Mar-81	384	863	1,247
Apr-81	392	903	1,295

MM/YR	BUYER'S COMM. ($/LOT)	HAULING PURCH. ($/LOT)	TOT. MKT. COSTS ($/LOT)
May-81	392	903	1,295
Jun-81	392	903	1,295
Jul-81	409	940	1,349
Aug-81	409	940	1,349
Sep-81	409	940	1,349
Oct-81	423	985	1,408
Nov-81	423	985	1,408
Dec-81	423	985	1,408
Jan-82	430	991	1,421
Feb-82	430	991	1,421
Mar-82	430	991	1,421
Apr-82	441	1,028	1,470
May-82	441	1,028	1,470
Jun-82	441	1,028	1,470
Jul-82	439	1,025	1,464
Aug-82	439	1,025	1,464
Sep-82	439	1,025	1,464
Oct-82	444	1,051	1,495
Nov-82	444	1,051	1,495
Dec-82	444	1,051	1,495
Jan-83	450	1,029	1,479
Feb-83	450	1,029	1,479
Mar-83	450	1,029	1,479
Apr-83	459	1,068	1,526
May-83	459	1,068	1,526
Jun-83	459	1,068	1,526
Jul-83	463	1,067	1,530
Aug-83	463	1,067	1,530
Sep-83	463	1,067	1,530
Oct-83	468	1,070	1,539
Nov-83	468	1,070	1,539
Dec-83	468	1,070	1,539
Jan-84	476	1,086	1,562
Feb-84	476	1,086	1,562
Mar-84	476	1,086	1,562
Apr-84	480	1,071	1,551
May-84	480	1,071	1,551
Jun-84	480	1,071	1,551
Jul-84	485	1,082	1,567
Aug-84	485	1,082	1,567
Sep-84	485	1,082	1,567
Oct-84	488	1,098	1,586
Nov-84	488	1,098	1,586
Dec-84	488	1,098	1,586
Jan-85	491	1,115	1,606
Feb-85	491	1,115	1,606
Mar-85	491	1,115	1,606
Apr-85	493	1,107	1,599
May-85	493	1,107	1,599
Jun-85	493	1,107	1,599
Jul-85	491	1,110	1,600
Aug-85	491	1,110	1,600
Sep-85	491	1,110	1,600

APPENDIX P - NOMINAL PREDICTED NET RETURNS

MM/YR	PRED NET RET. %	PRED NET RET. $/LOT	PRED REVEN. $/LOT	PRED STEER COSTS $/LOT	PRED FEED COST $/LOT	PRED YARD COST $/LOT	PRED TRT. COST $/LOT	PRED PROC. COST $/LOT	PRED MKT. COST $/LOT
Jan-73	22.19	8,938	49,212	32,596	5,714	574	751	95	544
Feb-73	22.07	8,937	49,424	32,805	5,716	574	753	95	544
Mar-73	5.78	2,431	44,499	34,368	5,718	574	769	95	544
Apr-73	14.52	6,012	47,429	32,922	6,477	605	762	97	553
May-73	12.66	5,490	48,852	34,844	6,481	605	781	97	553
Jun-73	12.15	5,442	50,225	36,249	6,484	605	795	97	553
Jul-73	7.93	3,503	47,667	35,112	6,969	623	798	100	562
Aug-73	13.81	6,115	50,405	35,237	6,970	623	799	100	562
Sep-73	10.31	4,865	52,036	38,088	6,971	623	827	100	562
Oct-73	15.70	7,711	56,831	39,217	7,764	626	842	100	571
Nov-73	16.10	8,642	62,305	43,714	7,766	626	887	100	571
Dec-73	-4.56	-2,423	50,719	43,196	7,767	626	881	100	571
Jan-74	-13.81	-7,530	46,977	41,934	10,378	634	876	102	583
Feb-74	-13.43	-7,166	46,205	40,805	10,382	634	864	102	583
Mar-74	4.50	2,280	52,978	38,155	10,386	634	838	102	583
Apr-74	6.60	3,661	59,171	41,566	11,614	737	885	105	603
May-74	4.01	2,182	56,640	40,521	11,618	737	875	105	603
Jun-74	-2.07	-1,046	49,532	36,675	11,622	736	837	105	603
Jul-74	-1.34	-689	50,753	36,985	12,125	756	855	108	613
Aug-74	-14.79	-7,681	44,238	37,453	12,129	756	860	108	613
Sep-74	-18.81	-9,239	39,889	34,686	12,133	755	832	108	613
Oct-74	-2.94	-1,514	49,935	36,358	12,688	775	865	112	650
Nov-74	1.50	726	49,180	33,390	12,692	775	836	112	650
Dec-74	-5.08	-2,342	43,794	31,091	12,696	775	813	112	650
Jan-75	3.92	1,799	47,651	30,096	13,361	791	816	115	673
Feb-75	-8.78	-4,239	44,032	32,487	13,365	791	840	115	673
Mar-75	-8.27	-4,094	45,431	33,724	13,370	791	853	115	673
Apr-75	-11.53	-5,355	41,096	30,840	13,176	787	839	119	690
May-75	-3.03	-1,284	41,146	28,240	11,780	787	813	119	690
Jun-75	-0.21	-88	42,658	29,352	10,974	787	824	119	690
Jul-75	8.66	3,676	46,124	29,402	10,566	807	841	122	709
Aug-75	7.38	3,410	49,604	33,306	10,370	807	880	122	709
Sep-75	5.62	2,627	49,353	34,201	9,998	807	889	122	709
Oct-75	0.38	176	47,036	33,716	10,544	825	900	126	750
Nov-75	6.48	2,947	48,424	30,623	12,286	824	869	126	750
Dec-75	24.74	10,552	53,203	29,210	10,887	824	855	126	750
Jan-76	5.18	2,294	46,605	30,899	10,766	847	891	130	778
Feb-76	13.67	5,839	48,557	29,310	10,777	847	875	130	778
Mar-76	5.72	2,501	46,234	30,305	10,787	847	885	130	778
Apr-76	1.19	508	43,127	29,118	10,860	841	882	132	785
May-76	6.53	2,878	46,946	30,857	10,553	841	900	132	785
Jun-76	2.06	918	45,531	31,375	10,575	841	905	132	785
Jul-76	9.06	4,211	50,685	33,248	10,495	858	939	136	798
Aug-76	4.95	2,304	48,866	33,365	10,465	858	940	136	798
Sep-76	6.27	2,863	48,531	32,470	10,474	858	931	136	798
Oct-76	5.98	2,592	45,942	30,447	10,167	872	923	138	804
Nov-76	12.80	5,329	46,954	29,268	9,632	872	911	138	804
Dec-76	1.71	712	42,302	29,854	9,006	872	917	138	804

MM/YR	PRED NET RET. %	PRED NET RET. $/LOT	PRED REVEN. $/LOT	PRED STEER COSTS $/LOT	PRED FEED COST $/LOT	PRED YARD COST $/LOT	PRED TRT. COST $/LOT	PRED PROC. COST $/LOT	PRED MKT. COST $/LOT
Jan-77	11.95	4,685	43,883	27,396	9,054	883	902	140	822
Feb-77	12.65	4,864	43,296	26,894	8,796	884	897	140	822
Mar-77	13.40	5,215	44,150	26,961	9,230	884	898	140	822
Apr-77	6.56	2,608	42,356	27,429	9,456	965	916	143	839
May-77	10.99	4,528	45,732	28,825	9,501	965	930	143	839
Jun-77	12.49	5,268	47,430	29,812	9,463	965	940	143	839
Jul-77	16.81	7,276	50,564	30,731	9,630	973	955	145	854
Aug-77	10.86	4,792	48,910	31,308	9,878	973	960	145	854
Sep-77	1.89	841	45,228	32,178	9,269	973	969	145	854
Oct-77	1.11	486	44,414	32,545	8,391	990	987	148	867
Nov-77	0.35	152	43,544	32,947	7,449	990	991	148	867
Dec-77	3.17	1,398	45,549	33,607	7,542	990	998	148	867
Jan-78	6.61	2,907	46,901	33,524	7,421	1,004	1,010	151	884
Feb-78	2.19	1,001	46,670	34,987	7,619	1,004	1,024	151	884
Mar-78	6.14	2,772	47,915	34,527	7,558	1,004	1,020	151	884
Apr-78	3.28	1,568	49,407	36,851	7,845	1,026	1,063	155	900
May-78	9.37	4,700	54,864	39,150	7,848	1,026	1,085	155	900
Jun-78	12.21	6,580	60,491	42,736	7,973	1,026	1,121	155	900
Jul-78	8.49	4,945	63,196	46,958	8,058	1,026	1,164	155	890
Aug-78	6.61	4,278	68,995	53,462	7,956	1,026	1,229	155	890
Sep-78	-9.88	-6,751	61,547	57,508	7,450	1,026	1,269	155	890
Oct-78	-8.03	-5,442	62,363	57,358	7,083	1,034	1,275	157	898
Nov-78	-12.27	-8,356	59,721	57,851	6,858	1,034	1,280	157	898
Dec-78	2.06	1,427	70,810	59,172	6,830	1,033	1,293	157	898
Jan-79	0.55	388	70,941	59,866	7,218	1,060	1,324	162	923
Feb-79	3.39	2,329	77,104	58,135	7,189	1,060	1,306	162	923
Mar-79	8.58	6,113	77,372	60,610	7,172	1,060	1,331	162	923
Apr-79	6.26	4,860	82,521	66,679	7,336	1,101	1,420	168	956
May-79	2.18	1,864	87,175	73,978	7,616	1,101	1,493	168	956
Jun-79	-0.23	-209	90,364	79,152	7,651	1,101	1,545	168	956
Jul-79	3.22	2,849	91,289	76,494	8,151	1,118	1,533	172	972
Aug-79	2.20	1,917	88,979	74,763	8,521	1,118	1,515	172	972
Sep-79	-4.02	-3,455	82,451	73,083	9,063	1,118	1,499	172	972
Oct-79	-4.85	-4,022	78,947	70,174	9,024	1,130	1,480	174	987
Nov-79	-1.44	-1,174	80,289	67,925	9,791	1,129	1,458	174	987
Dec-79	1.60	1,391	88,409	72,740	10,483	1,128	1,506	174	987
Jan-80	7.74	6,231	86,729	65,944	10,739	1,150	1,457	178	1,029
Feb-80	13.71	11,029	91,492	65,409	11,245	1,150	1,452	178	1,029
Mar-80	6.84	5,797	90,547	69,505	11,395	1,150	1,493	178	1,029
Apr-80	-2.79	-2,449	85,250	71,896	11,843	1,179	1,536	183	1,062
May-80	3.73	3,228	89,659	71,353	11,125	1,178	1,531	183	1,062
Jun-80	3.22	2,654	85,110	67,423	11,118	1,179	1,492	183	1,062
Jul-80	5.23	3,985	80,173	61,020	11,233	1,195	1,442	186	1,113
Aug-80	7.45	5,624	81,114	59,632	11,935	1,196	1,428	186	1,113
Sep-80	6.01	4,522	79,727	58,386	12,909	1,196	1,416	186	1,113
Oct-80	4.85	3,914	84,614	62,717	13,968	1,213	1,474	189	1,140
Nov-80	2.26	1,866	84,609	64,999	13,706	1,212	1,496	189	1,140
Dec-80	3.70	3,068	86,941	64,899	13,938	1,212	1,495	189	1,140
Jan-81	6.61	5,532	89,183	65,108	14,356	1,256	1,536	198	1,196
Feb-81	2.63	2,262	88,409	66,529	15,419	1,254	1,551	198	1,196
Mar-81	2.67	2,322	89,336	67,290	15,518	1,254	1,558	198	1,196
Apr-81	-1.91	-1,661	85,217	67,206	15,308	1,309	1,600	207	1,247
May-81	4.10	3,438	87,208	64,372	15,064	1,309	1,572	207	1,247
Jun-81	-0.08	-70	83,019	63,620	15,144	1,308	1,564	207	1,247

MM/YR	PRED NET RET. %	PRED NET RET. $/LOT	PRED REVEN. $/LOT	PRED STEER COSTS $/LOT	PRED FEED COST $/LOT	PRED YARD COST $/LOT	PRED TRT. COST $/LOT	PRED PROC. COST $/LOT	PRED MKT. COST $/LOT
Jul-81	4.12	3,463	87,425	64,104	15,435	1,329	1,587	211	1,295
Aug-81	1.48	1,218	83,448	62,307	15,519	1,329	1,569	211	1,295
Sep-81	0.19	154	81,877	62,692	14,625	1,327	1,573	211	1,295
Oct-81	-3.18	-2,629	79,923	63,352	14,635	1,375	1,621	221	1,349
Nov-81	5.81	4,657	84,829	61,613	14,010	1,376	1,603	221	1,349
Dec-81	9.73	7,545	85,078	60,493	12,501	1,378	1,592	221	1,349
Jan-82	6.18	4,722	81,097	59,022	12,682	1,422	1,612	228	1,408
Feb-82	6.80	5,002	78,575	56,505	12,421	1,423	1,587	228	1,408
Mar-82	-6.24	-4,658	69,945	57,333	12,616	1,423	1,595	228	1,408
Apr-82	4.10	2,873	73,036	52,467	13,082	1,396	1,564	232	1,421
May-82	6.85	5,029	78,494	55,686	13,133	1,396	1,596	232	1,421
Jun-82	11.28	8,367	82,568	56,990	12,553	1,396	1,609	232	1,421
Jul-82	6.75	5,146	81,358	58,503	12,935	1,415	1,651	238	1,470
Aug-82	8.41	6,640	85,585	60,986	13,161	1,415	1,676	238	1,470
Sep-82	-1.69	-1,374	80,043	63,636	12,955	1,416	1,702	238	1,470
Oct-82	1.72	1,367	80,929	62,759	12,003	1,412	1,688	237	1,464
Nov-82	3.52	2,798	82,244	63,645	10,991	1,413	1,697	237	1,464
Dec-82	-0.98	-763	76,980	62,733	10,207	1,414	1,688	237	1,464
Jan-83	1.50	1,113	75,561	59,774	9,831	1,440	1,669	239	1,495
Feb-83	-5.61	-4,354	73,249	61,998	10,739	1,440	1,692	239	1,495
Mar-83	-2.30	-1,735	73,733	59,732	10,891	1,441	1,669	239	1,495
Apr-83	-0.33	-254	776,533	61,036	10,842	1,491	1,696	243	1,479
May-83	3.92	3,069	81,263	62,717	10,551	1,492	1,713	243	1,479
Jun-83	6.87	5,427	84,383	63,712	10,308	1,492	1,723	243	1,479
Jul-83	4.46	3,509	82,176	63,444	10,178	1,529	1,742	247	1,526
Aug-83	3.41	2,617	79,274	61,396	10,238	1,529	1,721	247	1,526
Sep-83	-5.62	-4,353	73,041	62,516	9,843	1,529	1,733	247	1,526
Oct-83	-4.89	-3,770	73,362	62,566	9,500	1,541	1,744	250	1,530
Nov-83	-4.78	-3,702	73,777	61,555	10,870	1,541	1,734	250	1,530
Dec-83	-1.29	-969	74,286	58,528	11,702	1,541	1,703	250	1,530
Jan-84	-4.33	-3,339	73,725	59,180	12,824	1,546	1,723	253	1,539
Feb-84	0.55	423	77,078	58,729	12,871	1,546	1,718	253	1,539
Mar-84	4.71	3,777	84,004	62,232	12,906	1,546	1,753	253	1,539
Apr-84	3.24	2,687	85,717	64,865	12,977	1,571	1,798	257	1,562
May-84	2.68	2,226	85,244	65,300	12,527	1,570	1,802	257	1,562
Jun-84	6.96	5,751	88,437	64,439	13,064	1,570	1,794	257	1,562
Jul-84	2.88	2,319	82,962	62,332	13,139	1,579	1,782	259	1,551
Aug-84	3.74	2,986	82,890	60,869	13,879	1,578	1,768	259	1,551
Sep-84	0.75	609	82,245	62,792	13,668	1,578	1,787	259	1,551
Oct-84	2.57	2,098	83,599	63,762	12,508	1,593	1,809	262	1,567
Nov-84	4.43	3,565	84,113	62,391	12,939	1,593	1,795	262	1,567
Dec-84	5.06	4,068	84,547	62,324	12,937	1,594	1,795	262	1,567
Jan-85	6.06	4,910	85,973	62,641	13,162	1,604	1,806	264	1,586
Feb-85	7.65	6,224	87,602	62,399	13,722	1,605	1,803	264	1,586
Mar-85	7.11	5,978	90,050	64,748	14,043	1,604	1,827	264	1,586
Apr-85	6.36	5,381	89,928	65,208	14,019	1,612	1,837	265	1,606
May-85	11.31	9,486	93,362	64,581	13,980	1,613	1,831	265	1,606
Jun-85	9.80	8,286	92,877	65,166	14,104	1,614	1,837	265	1,606
Jul-85	6.81	5,658	88,727	63,319	14,448	1,614	1,823	266	1,599
Aug-85	6.02	5,001	88,084	63,695	14,082	1,614	1,827	266	1,599
Sep-85	-0.24	-199	83,676	65,083	13,471	1,614	1,841	266	1,599
Oct-85	-4.50	-3,594	76,279	61,287	13,313	1,609	1,798	265	1,600
Nov-85	1.25	967	78,551	60,050	12,266	1,618	1,786	265	1,600
Dec-85	3.76	2,891	79,776	61,613	9,984	1,622	1,801	265	1,600

APPENDIX Q - REAL PREDICTED NET RETURNS

MM/YR	PRED NET RET. %	PRED NET RET. $/LOT	PRED REVENUE $/LOT	PRED STEER COSTS $/LOT	PRED FEED COST $/LOT	PRED YARD COST $/LOT	PRED TRTMT COST $/LOT	PRED PROC. COST $/LOT	PRED MKT. COST $/LOT
Jan-73	20.05	23,294	139,451	94,012	16,480	1,656	2,166	274	1,569
Feb-73	19.42	22,626	139,138	94,404	16,449	1,652	2,167	273	1,566
Mar-73	3.94	4,743	125,004	98,248	16,346	1,641	2,198	272	1,556
Apr-73	12.31	14,442	131,802	93,290	18,354	1,716	2,160	274	1,567
May-73	10.50	12,817	134,889	98,095	18,244	1,704	2,200	272	1,557
Jun-73	9.08	11,417	137,218	101,827	18,215	1,700	2,234	272	1,553
Jul-73	5.22	6,410	129,140	97,575	19,367	1,732	2,217	277	1,561
Aug-73	10.28	12,570	134,866	97,297	19,245	1,721	2,206	275	1,551
Sep-73	7.37	9,497	138,371	104,059	19,044	1,702	2,260	273	1,535
Oct-73	13.33	17,736	150,811	106,246	21,034	1,696	2,280	272	1,546
Nov-73	14.22	20,411	163,995	116,963	20,778	1,675	2,372	269	1,527
Dec-73	-6.10	-8,622	132,690	114,864	20,655	1,664	2,344	267	1,518
Jan-74	-15.71	-22,731	121,914	111,279	27,541	1,682	2,323	270	1,548
Feb-74	-15.49	-21,756	118,721	107,404	27,327	1,668	2,275	268	1,536
Mar-74	1.62	2,154	134,786	99,820	27,170	1,658	2,192	267	1,526
Apr-74	3.89	5,603	149,661	107,871	30,140	1,913	2,298	272	1,564
May-74	0.61	859	140,785	104,116	29,851	1,893	2,248	270	1,548
Jun-74	-5.59	-7,195	121,484	93,310	29,568	1,873	2,128	267	1,533
Jul-74	-4.87	-6,336	123,775	93,545	30,667	1,911	2,163	274	1,550
Aug-74	-17.33	-22,367	106,681	93,093	30,148	1,878	2,137	270	1,523
Sep-74	-20.61	-24,834	95,659	85,072	29,759	1,853	2,041	266	1,503
Oct-74	-5.44	-6,821	118,652	88,669	30,945	1,889	2,111	273	1,586
Nov-74	-1.08	-1,263	115,587	80,521	30,607	1,868	2,015	270	1,568
Dec-74	-7.81	-8,640	102,003	74,560	30,446	1,858	1,949	269	1,560
Jan-75	1.32	1,439	110,390	71,513	31,748	1,879	1,940	274	1,599
Feb-75	-10.73	-12,168	101,282	76,353	31,412	1,859	1,975	271	1,581
Mar-75	-9.89	-11,406	103,946	78,548	31,139	1,843	1,986	268	1,567
Apr-75	-13.08	-14,079	93,532	71,445	30,523	1,824	1,944	275	1,599
May-75	-4.88	-4,767	92,830	64,957	27,097	1,811	1,871	273	1,588
Jun-75	-2.95	-2,886	94,918	67,157	25,108	1,801	1,886	271	1,580
Jul-75	4.79	4,630	101,238	66,917	24,048	1,836	1,915	278	1,613
Aug-75	3.42	3,562	107,781	75,142	23,395	1,820	1,986	276	1,599
Sep-75	2.97	3,085	107,056	76,100	22,247	1,795	1,979	272	1,577
Oct-75	-1.79	-1,839	101,015	74,003	23,143	1,810	1,976	276	1,646
Nov-75	4.38	4,326	103,140	66,538	26,694	1,791	1,889	273	1,629
Dec-75	22.28	20,615	113,134	63,361	23,615	1,788	1,855	273	1,626
Jan-76	3.63	3,454	98,617	66,358	23,121	1,819	1,914	279	1,672
Feb-76	12.37	11,259	102,246	62,429	22,954	1,804	1,865	277	1,658
Mar-76	4.35	4,044	97,039	64,442	22,937	1,801	1,883	277	1,655
Apr-76	-0.11	-103	90,079	61,614	22,981	1,780	1,867	279	1,661
May-76	4.83	4,478	97,272	64,975	22,222	1,771	1,894	278	1,653
Jun-76	0.27	253	93,890	65,852	22,195	1,765	1,899	277	1,648
Jul-76	7.33	7,115	104,185	69,445	21,921	1,792	1,962	283	1,667
Aug-76	3.62	3,494	99,971	69,132	21,683	1,778	1,948	281	1,654
Sep-76	4.93	4,644	98,816	66,957	21,599	1,769	1,921	280	1,646
Oct-76	4.32	3,852	92,961	62,586	20,899	1,792	1,897	284	1,652
Nov-76	11.22	9,555	94,712	59,878	19,705	1,783	1,864	283	1,644
Dec-76	0.29	247	84,932	60,787	18,338	1,775	1,867	281	1,636

MM/YR	PRED NET RET. %	PRED NET RET. $/LOT	PRED REVENUE $/LOT	PRED STEER COSTS $/LOT	PRED FEED COST $/LOT	PRED YARD COST $/LOT	PRED TRTMT COST $/LOT	PRED PROC. COST $/LOT	PRED MKT. COST $/LOT
Jan-77	10.23	8,115	87,428	55,434	18,320	1,788	1,825	284	1,664
Feb-77	10.25	7,947	85,471	54,249	17,742	1,782	1,809	283	1,659
Mar-77	10.32	8,064	86,235	54,131	18,531	1,774	1,802	282	1,651
Apr-77	3.85	3,046	82,236	54,647	18,839	1,923	1,825	286	1,671
May-77	8.35	6,790	88,130	56,904	18,757	1,905	1,836	283	1,656
Jun-77	10.17	8,373	90,726	58,230	18,484	1,885	1,835	280	1,638
Jul-77	14.07	11,827	95,872	59,666	18,697	1,888	1,854	281	1,659
Aug-77	8.60	7,312	92,331	60,334	19,035	1,874	1,851	279	1,647
Sep-77	-0.03	-22	84,884	61,551	17,730	1,861	1,854	277	1,634
Oct-77	-0.78	-652	82,637	61,708	15,909	1,876	1,872	280	1,643
Nov-77	-1.80	-1,472	80,441	62,195	14,062	1,868	1,872	279	1,636
Dec-77	0.83	687	83,550	63,074	14,154	1,857	1,873	278	1,626
Jan-78	4.80	3,930	85,787	62,375	13,808	1,869	1,879	280	1,645
Feb-78	0.47	397	84,765	64,633	14,075	1,855	1,893	278	1,633
Mar-78	3.93	3,256	86,062	63,332	13,863	1,842	1,871	276	1,622
Apr-78	1.13	992	88,496	67,404	14,350	1,877	1,943	284	1,645
May-78	6.38	5,817	96,929	71,107	14,255	1,863	1,972	282	1,634
Jun-78	9.47	9,173	106,003	76,759	14,320	1,843	2,014	279	1,616
Jul-78	4.58	4,783	109,118	84,109	14,434	1,837	2,084	278	1,593
Aug-78	4.05	4,636	118,973	94,452	14,057	1,812	2,171	274	1,572
Sep-78	-11.09	-13,270	106,413	100,776	13,055	1,797	2,224	272	1,559
Oct-78	-8.88	-10,392	106,684	99,038	12,230	1,786	2,202	271	1,550
Nov-78	-13.65	-16,029	101,362	99,757	11,826	1,783	2,208	270	1,548
Dec-78	-0.08	-94	119,867	102,307	11,808	1,786	2,236	271	1,552
Jan-79	-1.28	-1,540	119,154	102,413	12,348	1,814	2,264	277	1,579
Feb-79	1.39	1,625	118,354	98,670	12,201	1,799	2,217	275	1,566
Mar-79	5.41	6,526	127,152	102,601	12,141	1,794	2,253	274	1,562
Apr-79	3.31	4,317	134,759	111,997	12,323	1,849	2,385	283	1,605
May-79	-0.75	-1,064	140,939	123,138	12,677	1,833	2,485	280	1,591
Jun-79	-2.34	-3,480	145,368	130,079	12,573	1,809	2,539	277	1,571
Jul-79	0.93	1,345	145,769	124,918	13,310	1,826	2,503	280	1,588
Aug-79	0.57	802	141,557	120,872	13,777	1,807	2,450	277	1,572
Sep-79	-5.89	-8,144	130,054	117,568	14,580	1,798	2,411	276	1,564
Oct-79	-6.69	-8,861	123,624	112,053	14,410	1,804	2,364	278	1,576
Nov-79	-3.92	-5,081	124,520	108,063	15,577	1,795	2,319	277	1,570
Dec-79	-0.70	-960	136,297	114,737	16,535	1,779	2,375	274	1,557
Jan-80	5.45	6,864	132,916	103,261	16,817	1,801	2,282	279	1,611
Feb-80	11.44	14,274	139,064	101,442	17,440	1,784	2,252	276	1,596
Mar-80	4.23	5,532	136,189	107,154	17,568	1,773	2,302	275	1,586
Apr-80	-5.15	-6,921	127,481	110,184	18,151	1,807	2,354	280	1,627
May-80	0.89	1,172	132,543	108,453	16,909	1,791	2,327	278	1,614
Jun-80	0.31	380	124,400	101,409	16,722	1,774	2,243	275	1,597
Jul-80	2.05	2,334	116,264	91,248	16,798	1,787	2,156	278	1,664
Aug-80	4.47	4,987	116,584	88,154	17,644	1,767	2,111	275	1,645
Sep-80	3.33	3,661	113,583	85,339	18,868	1,748	2,069	272	1,626
Oct-80	2.11	2,465	119,493	90,950	20,256	1,759	2,137	274	1,653
Nov-80	-0.83	-983	117.943	93,423	19,700	1,743	2,151	272	1,638
Dec-80	0.93	1,094	119,158	92,457	19,857	1,726	2,130	269	1,623
Jan-81	3.35	3,952	122,084	91,946	20,274	1,773	2,170	279	1,690
Feb-81	-0.27	-328	119,758	92,739	21,493	1,748	2,161	276	1,668
Mar-81	-0.94	-1,131	119,515	93,298	21,516	1,739	2,160	274	1,659
Apr-81	-4.93	-5,859	113,069	92,000	20,956	1,792	2,190	284	1,707
May-81	1.14	1,295	114,771	87,198	20,406	1,773	2,129	281	1,689
Jun-81	-3.28	-3,648	107,509	85,111	20,259	1,750	2,092	277	1,668

MM/YR	PRED NET RET. %	PRED NET RET. $/LOT	PRED REVENUE $/LOT	PRED STEER COSTS $/LOT	PRED FEED COST $/LOT	PRED YARD COST $/LOT	PRED TRTMT COST $/LOT	PRED PROC. COST $/LOT	PRED MKT. COST $/LOT
Jul-81	0.82	913	112,317	85,057	20,480	1,764	2,106	281	1,718
Aug-81	-1.72	-1,856	106,363	82,000	20,424	1,749	2,065	278	1,704
Sep-81	-2.06	-2,184	103,647	81,186	18,939	1,719	2,037	274	1,676
Oct-81	-5.53	-5,863	100,194	81,390	18,802	1,766	2,082	283	1,733
Nov-81	3.17	3,238	105,425	78,533	17,857	1,754	2,044	281	1,719
Dec-81	7.22	7,082	105,230	76,577	15,824	1,744	2,015	279	1,708
Jan-82	4.07	3,894	99,640	73,991	15,899	1,783	2,021	286	1,765
Feb-82	4.30	3,929	95,365	70,225	15,437	1,768	1,972	284	1,750
Mar-82	-9.11	-8,405	83,869	70,913	15,604	1,760	1,973	282	1,742
Apr-82	1.03	886	87,092	64,464	16,073	1,715	1,922	285	1,746
May-82	3.55	3,162	92,325	67,585	15,940	1,694	1,938	282	1,725
Jun-82	8.07	7,183	96,156	68,335	15,051	1,674	1,930	279	1,704
Jul-82	3.70	3,359	94,238	69,762	15,425	1,687	1,968	284	1,752
Aug-82	6.29	5,838	98,694	71,732	15,479	1,664	1,971	280	1,728
Sep-82	-3.17	-3,004	91,812	74,109	15,087	1,649	1,982	277	1,711
Oct-82	0.11	98	92,256	72,694	13,903	1,635	1,956	275	1,696
Nov-82	1.62	1,485	93,100	73,393	12,674	1,629	1,957	273	1,688
Dec-82	-2.28	-2,033	87,141	71,957	11,707	1,622	1,936	272	1,679
Jan-83	1.05	892	85,760	68,140	11,207	1,641	1,903	273	1,704
Feb-83	-5.77	-5,073	82,773	70,181	12,157	1,630	1,915	271	1,692
Mar-83	-3.48	-2,973	82,456	67,616	12,329	1,631	1,889	271	1,692
Apr-83	-1.79	-1,563	85,588	69,274	12,305	1,693	1,925	275	1,678
May-83	2.58	2,281	90,643	70,871	11,923	1,686	1,936	274	1,671
Jun-83	5.42	4,783	93,080	71,249	11,528	1,668	1,927	271	1,654
Jul-83	2.60	2,288	90,261	70,950	11,382	1,709	1,948	277	1,707
Aug-83	1.32	1,128	86,633	68,482	11,419	1,705	1,920	276	1,702
Sep-83	-6.50	-5,550	79,821	68,959	10,857	1,686	1,911	273	1,683
Oct-83	-5.92	-5,019	79,701	68,722	10,435	1,693	1,915	274	1,681
Nov-83	-5.34	-4,519	80,152	67,269	11,879	1,684	1,895	273	1,672
Dec-83	-2.20	-1,806	80,435	63,961	12,788	1,684	1,862	273	1,672
Jan-84	-5.13	-4,294	79,430	64,294	13,932	1,680	1,871	274	1,672
Feb-84	-0.86	-718	82,561	63,804	13,983	1,680	1,867	274	1,672
Mar-84	3.33	2,888	89,757	67,383	13,974	1,674	1,898	274	1,666
Apr-84	2.13	1,907	91,361	69,884	13,981	1,692	1,937	277	1,683
May-84	2.01	1,784	90,707	69,945	13,418	1,682	1,930	275	1,673
Jun-84	6.08	5,372	93,720	68,852	13,959	1,678	1,916	274	1,669
Jul-84	1.70	1,465	87,417	66,436	14,004	1,683	1,900	276	1,654
Aug-84	2.72	2,316	87,342	64,770	14,769	1,679	1,881	276	1,651
Sep-84	0.09	79	86,591	66,543	14,485	1,672	1,894	274	1,644
Oct-84	2.32	1,996	87,874	67,186	13,180	1,678	1,906	276	1,651
Nov-84	3.50	2,971	87,843	65,741	13,633	1,679	1,892	276	1,651
Dec-84	4.12	3,494	88,226	65,617	13,620	1,678	1,890	276	1,650
Jan-85	4.87	4,146	89,354	65,845	13,835	1,686	1,898	277	1,668
Feb-85	6.45	5,478	90,466	65,167	14,330	1,676	1,883	275	1,657
Mar-85	5.75	5,043	92,773	67,566	14,654	1,674	1,906	275	1,655
Apr-85	5.02	4,407	92,280	67,772	14,571	1,676	1,909	275	1,669
May-85	10.34	8,958	95,576	66,693	14,437	1,666	1,891	273	1,658
Jun-85	8.50	7,408	94,557	67,136	14,531	1,662	1,892	273	1,654
Jul-85	5.64	4,807	90,048	64,974	14,825	1,656	1,871	273	1,641
Aug-85	4.94	4,203	89,256	65,205	14,416	1,652	1,870	272	1,637
Sep-85	-0.86	-735	84,656	66,259	13,715	1,644	1,874	271	1,628
Oct-85	-5.09	-4,129	76,933	62,200	13,512	1,633	1,825	269	1,624
Nov-85	0.38	300	78,917	60,849	12,429	1,639	1,809	268	1,622
Dec-85	2.56	1,990	79,776	62,335	10,101	1,641	1,822	268	1,619

APPENDIX R - PREDICTED REVENUE

NO. OF ANIMALS PURCHASED :	100
DEATH LOSS (% OF ANIMALS) :	0.4
NET SALES (# OF ANIMALS) :	99.6
SALE WEIGHT (KG) :	520
SHRINK PERCENTAGE :	4
NUMBER OF LOTS USED TO MEASURE GRADE DISCOUNT :	117
WTED REAL MEAN DISCOUNT ($/CWT) :	0.16
WTED REAL MEAN DISCOUNT ($/KG) :	0.0035

This table provides a time series of predicted revenue based on the use of Chicago futures prices at the time of purchase to predict sale price.

MM/YR	MARKET WT (KG)	PRICE ($/KG)	WEIGHTED DISCOUNT ($/KG)	PRICE LESS MEAN DISC ($/KG)	REVENUE ($/LOT)
Jan-73	520	0.9910	0.0012	0.9898	49,212
Feb-73	520	0.9953	0.0013	0.9940	49,424
Mar-73	520	0.8962	0.0013	0.8950	44,499
Apr-73	520	0.9552	0.0013	0.9539	47,429
May-73	520	0.9838	0.0013	0.9825	48,852
Jun-73	520	1.0114	0.0013	1.0102	50,225
Jul-73	520	0.9600	0.0013	0.9587	47,667
Aug-73	520	1.0151	0.0013	1.0138	50,405
Sep-73	520	1.0479	0.0013	1.0466	52,036
Oct-73	520	1.1443	0.0013	1.1430	56,831
Nov-73	520	1.2545	0.0013	1.2531	62,305
Dec-73	520	1.0214	0.0013	1.0201	50,719
Jan-74	520	0.9462	0.0014	0.9448	46,977
Feb-74	520	0.9307	0.0014	0.9293	46,205
Mar-74	520	1.0669	0.0014	1.0655	52,978
Apr-74	520	1.1915	0.0014	1.1901	59,171
May-74	520	1.1406	0.0014	1.1393	56,640
Jun-74	520	0.9976	0.0014	0.9962	49,532
Jul-74	520	1.0222	0.0014	1.0208	50,753
Aug-74	520	0.8912	0.0015	0.8897	44,238
Sep-74	520	0.8037	0.0015	0.8023	39,889
Oct-74	520	1.0058	0.0015	1.0043	49,935
Nov-74	520	0.9906	0.0015	0.9891	49,180
Dec-74	520	0.8823	0.0015	0.8808	43,794
Jan-75	520	0.9599	0.0015	0.9584	47,651
Feb-75	520	0.8871	0.0015	0.8856	44,032
Mar-75	520	0.9153	0.0015	0.9137	45,431
Apr-75	520	0.8281	0.0015	0.8266	41,096
May-75	520	0.8291	0.0016	0.8276	41,146
Jun-75	520	0.8595	0.0016	0.8580	42,658
Jul-75	520	0.9293	0.0016	0.9277	46,124
Aug-75	520	0.9993	0.0016	0.9977	49,604
Sep-75	520	0.9942	0.0016	0.9926	49,353
Oct-75	520	0.9477	0.0016	0.9460	47,036
Nov-75	520	0.9756	0.0017	0.9739	48,424
Dec-75	520	1.0717	0.0017	1.0701	53,203
Jan-76	520	0.9390	0.0017	0.9373	46,605
Feb-76	520	0.9783	0.0017	0.9766	48,557
Mar-76	520	0.9316	0.0017	0.9299	46,234
Apr-76	520	0.8691	0.0017	0.8674	43,127
May-76	520	0.9459	0.0017	0.9442	46,946
Jun-76	520	0.9174	0.0017	0.9157	45,531
Jul-76	520	1.0211	0.0017	1.0194	50,685
Aug-76	520	0.9845	0.0017	0.9828	48,866
Sep-76	520	0.9778	0.0017	0.9761	48,531
Oct-76	520	0.9258	0.0017	0.9240	45,942
Nov-76	520	0.9461	0.0017	0.9444	46,954
Dec-76	520	0.8526	0.0018	0.8508	42,302

MM/YR	MARKET WT (KG)	PRICE ($/KG)	WEIGHTED DISCOUNT ($/KG)	PRICE LESS MEAN DISC ($/KG)	REVENUE ($/LOT)
Jan-77	520	0.8844	0.0018	0.8826	43,883
Feb-77	520	0.8726	0.0018	0.8708	43,296
Mar-77	520	0.8898	0.0018	0.8880	44,150
Apr-77	520	0.8537	0.0018	0.8519	42,356
May-77	520	0.9216	0.0018	0.9198	45,732
Jun-77	520	0.9558	0.0018	0.9539	47,430
Jul-77	520	1.0188	0.0019	1.0170	50,564
Aug-77	520	0.9856	0.0019	0.9837	48,910
Sep-77	520	0.9115	0.0019	0.9096	45,228
Oct-77	520	0.8952	0.0019	0.8933	44,414
Nov-77	520	0.8777	0.0019	0.8758	43,544
Dec-77	520	0.9180	0.0019	0.9161	45,549
Jan-78	520	0.9452	0.0019	0.9433	46,901
Feb-78	520	0.9406	0.0019	0.9387	46,670
Mar-78	520	0.9657	0.0020	0.9637	47,915
Apr-78	520	0.9957	0.0020	0.9937	49,407
May-78	520	1.1054	0.0020	1.1035	55,864
Jun-78	520	1.2186	0.0020	1.2166	60,491
Jul-78	520	1.2731	0.0020	1.2710	63,196
Aug-78	520	1.3897	0.0020	1.3877	68,995
Sep-78	520	1.2399	0.0020	1.2379	61,547
Oct-78	520	1.2563	0.0021	1.2543	62,363
Nov-78	520	1.2032	0.0021	1.2011	59,721
Dec-78	520	1.4262	0.0021	1.4242	70,810
Jan-79	520	1.4289	0.0021	1.4268	70,941
Feb-79	520	1.4322	0.0021	1.4301	71,104
Mar-79	520	1.5583	0.0021	1.5561	77,372
Apr-79	520	1.6618	0.0022	1.6597	82,521
May-79	520	1.7555	0.0022	1.7533	87,715
Jun-79	520	1.8196	0.0022	1.8174	90,364
Jul-79	520	1.8383	0.0022	1.8360	91,289
Aug-79	520	1.7918	0.0022	1.7896	88,979
Sep-[illegible]	520	1.6605	0.0022	1.6583	82,451
Oct-79	520	1.5901	0.0022	1.5878	78,947
Nov-79	520	1.6171	0.0023	1.6148	80,289
Dec-79	520	1.7804	0.0023	1.7781	88,409
Jan-80	520	1.7466	0.0023	1.7443	86,729
Feb-80	520	1.8425	0.0023	1.8401	91,492
Mar-80	520	1.8235	0.0023	1.8211	90,547
Apr-80	520	1.7169	0.0024	1.7146	85,250
May-80	520	1.8056	0.0024	1.8033	89,659
Jun-80	520	1.7142	0.0024	1.7118	85,110
Jul-80	520	1.6149	0.0024	1.6125	80,173
Aug-80	520	1.6339	0.0024	1.6314	81,114
Sep-80	520	1.6060	0.0025	1.6035	79,727
Oct-80	520	1.7043	0.0025	1.7018	84,614
Nov-80	520	1.7042	0.0025	1.7017	84,609
Dec-80	520	1.7310	0.0025	1.7285	85,941
Jan-81	520	1.7963	0.0026	1.7937	89,183
Feb-81	520	1.7807	0.0026	1.7781	88,409
Mar-81	520	1.7994	0.0026	1.7968	89,336
Apr-81	520	1.7166	0.0027	1.7139	85,217
May-81	520	1.7567	0.0027	1.7540	87,208
Jun-81	520	1.6724	0.0027	1.6697	83,019

MM/YR	MARKET WT (KG)	PRICE ($/KG)	WEIGHTED DISCOUNT ($/KG)	PRICE LESS MEAN DISC ($/KG)	REVENUE ($/LOT)
Jul-81	520	1.7611	0.0027	1.7583	87,425
Aug-81	520	1.6811	0.0028	1.6783	83,448
Sep-81	520	1.6495	0.0028	1.6467	81,877
Oct-81	520	1.6103	0.0028	1.6075	79,923
Nov-81	520	1.7089	0.0028	1.7061	84,829
Dec-81	520	1.7140	0.0028	1.7111	85,078
Jan-82	520	1.6339	0.0029	1.6311	81,097
Feb-82	520	1.5832	0.0029	1.5803	78,575
Mar-82	520	1.4097	0.0029	1.4068	69,945
Apr-82	520	1.4719	0.0030	1.4689	73,036
May-82	520	1.5817	0.0030	1.5787	78,494
Jun-82	520	1.6637	0.0030	1.6606	82,568
Jul-82	520	1.6393	0.0030	1.6363	81,358
Aug-82	520	1.7244	0.0031	1.7213	85,585
Sep-82	520	1.6129	0.0031	1.6099	80,043
Oct-82	520	1.6308	0.0031	1.6277	80,929
Nov-82	520	1.6572	0.0031	1.6541	82,244
Dec-82	520	1.5514	0.0031	1.5483	76,980
Jan-83	520	1.5228	0.0031	1.5197	75,561
Feb-83	520	1.4763	0.0031	1.4732	73,249
Mar-83	520	1.4861	0.0031	1.4829	73,733
Apr-83	520	1.5424	0.0031	1.5393	76,533
May-83	520	1.6376	0.0032	1.6344	81,263
Jun-83	520	1.7004	0.0032	1.6972	84,383
Jul-83	520	1.6560	0.0032	1.6528	82,176
Aug-83	520	1.5976	0.0032	1.5944	79,274
Sep-83	520	1.4722	0.0032	1.4690	73,041
Oct-83	520	1.4787	0.0032	1.4755	73,362
Nov-83	520	1.4871	0.0032	1.4838	73,777
Dec-83	520	1.4973	0.0033	1.4941	74,286
Jan-84	520	1.4861	0.0033	1.4828	73,725
Feb-84	520	1.5535	0.0033	1.5502	77,078
Mar-84	520	1.6928	0.0033	1.6895	84,004
Apr-84	520	1.7273	0.0033	1.7240	85,717
May-84	520	1.7178	0.0033	1.7145	85,244
Jun-84	520	1.7820	0.0033	1.7787	88,437
Jul-84	520	1.6719	0.0033	1.6686	82,962
Aug-84	520	1.6705	0.0033	1.6671	82,890
Sep-84	520	1.6575	0.0033	1.6541	82,245
Oct-84	520	1.6847	0.0033	1.6814	83,599
Nov-84	520	1.6951	0.0034	1.6917	84,113
Dec-84	520	1.7038	0.0034	1.7004	84,547
Jan-85	520	1.7325	0.0034	1.7291	85,973
Feb-85	520	1.7653	0.0034	1.7619	87,602
Mar-85	520	1.8146	0.0034	1.8111	90,050
Apr-85	520	1.8121	0.0034	1.8087	89,928
May-85	520	1.8812	0.0034	1.8777	93,362
Jun-85	520	1.8715	0.0035	1.8680	92,877
Jul-85	520	1.7880	0.0035	1.7845	88,727
Aug-85	520	1.7751	0.0035	1.7716	88,084
Sep-85	520	1.6864	0.0035	1.6829	83,676
Oct-85	520	1.5377	0.0035	1.5342	76,279
Nov-85	520	1.5834	0.0035	1.5799	78,551
Dec-85	520	1.6080	0.0035	1.6045	79,776

APPENDIX S - PREDICTED STEER COSTS

PURCHASE WT OF STEERS (KG/HEAD) :	380
NO. OF STEERS PURCHASED :	100

This table provides a time series of predicted steer costs. These costs are the same as for realized steer costs since steer costs are assumed to be known at the beginning of the period.

MM/YR	PURCHASE WT. (KG)	PRICE $/CWT	PRICE $/KG	STEER COST ($)
Oct-72	380	38.99	0.8578	32,596
Nov-72	380	39.24	0.8633	32,805
Dec-72	380	41.11	0.9044	34,368
Jan-73	380	39.38	0.8664	32,922
Feb-73	380	41.68	0.9170	34,844
Mar-73	380	43.36	0.9539	36,249
Apr-73	380	42.00	0.9240	35,112
May-73	380	42.15	0.9273	35,237
Jun-73	380	45.56	1.0023	38,088
Jul-73	380	46.91	1.0320	39,217
Aug-73	380	52.29	1.1504	43,714
Sep-73	380	51.67	1.1367	43,196
Oct-73	380	50.16	1.1035	41,934
Nov-73	380	48.81	1.0738	40,805
Dec-73	380	45.64	1.0041	38,155
Jan-74	380	49.72	1.0938	41,566
Feb-74	380	48.47	1.0663	40,521
Mar-74	380	43.87	0.9651	36,675
Apr-74	380	44.24	0.9733	36,985
May-74	380	44.80	0.9856	37,453
Jun-74	380	41.49	0.9128	34,686
Jul-74	380	43.49	0.9568	36,358
Aug-74	380	39.94	0.8787	33,390
Sep-74	380	37.19	0.8182	31,091
Oct-74	380	36.00	0.7920	30,096
Nov-74	380	38.86	0.8549	32,487
Dec-74	380	40.34	0.8875	33,724
Jan-75	380	36.89	0.8116	30,840
Feb-75	380	33.78	0.7432	28,240
Mar-75	380	35.11	0.7724	29,352
Apr-75	380	35.17	0.7737	29,402
May-75	380	39.84	0.8765	33,306
Jun-75	380	40.91	0.9000	34,201
Jul-75	380	40.33	0.8873	33,716
Aug-75	380	36.63	0.8059	30,623
Sep-75	380	34.94	0.7687	29,210
Oct-75	380	36.96	0.8131	30,899
Nov-75	380	35.06	0.7713	29,310
Dec-75	380	36.25	0.7975	30,305
Jan-76	380	34.83	0.7663	29,118
Feb-76	380	36.91	0.8120	30,857
Mar-76	380	37.53	0.8257	31,375
Apr-76	380	39.77	0.8749	33,248
May-76	380	39.91	0.8780	33,365
Jun-76	380	38.84	0.8545	32,470
Jul-76	380	36.42	0.8012	30,447
Aug-76	380	35.01	0.7702	29,268
Sep-76	380	35.71	0.7856	29,854
Oct-76	380	32.77	0.7209	27,396
Nov-76	380	32.17	0.7077	26,894
Dec-76	380	32.25	0.7095	26,961

MM/YR	PURCHASE WT. (KG)	PRICE $/CWT	PRICE $/KG	STEER COST ($)
Jan-77	380	32.81	0.7218	27,429
Feb-77	380	34.48	0.7586	28,825
Mar-77	380	35.66	0.7845	29,812
Apr-77	380	36.76	0.8087	30,731
May-77	380	37.45	0.8239	31,308
Jun-77	380	38.49	0.8468	32,178
Jul-77	380	38.93	0.8565	32,545
Aug-77	380	39.41	0.8670	32,947
Sep-77	380	40.20	0.8844	33,607
Oct-77	380	40.10	0.8822	33,524
Nov-77	380	41.85	0.9207	34,987
Dec-77	380	41.30	0.9086	34,527
Jan-78	380	44.08	0.9698	36,851
Feb-78	380	46.83	1.0303	39,150
Mar-78	380	51.12	1.1246	42,736
Apr-78	380	56.17	1.2357	46,958
May-78	380	63.95	1.4069	53,462
Jun-78	380	68.79	1.5134	57,508
Jul-78	380	68.61	1.5094	57,358
Aug-78	380	69.20	1.5224	57,851
Sep-78	380	70.78	1.5572	59,172
Oct-78	380	71.61	1.5754	59,866
Nov-78	380	69.54	1.5299	58,135
Dec-78	380	72.50	1.5950	60,610
Jan-79	380	79.76	1.7547	66,679
Feb-79	380	88.49	1.9468	73,978
Mar-79	380	94.68	2.0830	79,152
Apr-79	380	91.50	2.0130	76,494
May-79	380	89.43	1.9675	74,763
Jun-79	380	87.42	1.9232	73,083
Jul-79	380	83.94	1.8467	70,174
Aug-79	380	81.25	1.7875	67,925
Sep-79	380	87.01	1.9142	72,740
Oct-79	380	78.88	1.7354	65,944
Nov-79	380	78.24	1.7213	65,409
Dec-79	380	83.14	1.8291	69,505
Jan-80	380	86.00	1.8920	71,896
Feb-80	380	85.35	1.8777	71,353
Mar-80	380	80.65	1.7743	67,423
Apr-80	380	72.99	1.6058	61,020
May-80	380	71.33	1.5693	59,632
Jun-80	380	69.84	1.5365	58,386
Jul-80	380	75.02	1.6504	62,717
Aug-80	380	77.75	1.7105	64,999
Sep-80	380	77.63	1.7079	64,899
Oct-80	380	77.88	1.7134	65,108
Nov-80	380	79.58	1.7508	66,529
Dec-80	380	80.49	1.7708	67,290
Jan-81	380	80.39	1.7686	67,206
Feb-81	380	77.00	1.6940	64,372
Mar-81	380	76.10	1.6742	63,620
Apr-81	380	76.68	1.6870	64,104
May-81	380	74.53	1.6397	62,307
Jun-81	380	74.99	1.6498	62,692

MM/YR	PURCHASE WT. (KG)	PRICE $/CWT	PRICE $/KG	STEER COST ($)
Jul-81	380	75.78	1.6672	63,352
Aug-81	380	73.70	1.6214	61,613
Sep-81	380	72.36	1.5919	60,493
Oct-81	380	70.60	1.5532	59,022
Nov-81	380	67.59	1.4870	56,505
Dec-81	380	68.58	1.5088	57,333
Jan-82	380	62.76	1.3807	52,467
Feb-82	380	66.61	1.4654	55,686
Mar-82	380	68.17	1.4997	56,990
Apr-82	380	69.98	1.5396	58,503
May-82	380	72.95	1.6049	60,986
Jun-82	380	76.12	1.6746	63,636
Jul-82	380	75.07	1.6515	62,759
Aug-82	380	76.13	1.6749	63,645
Sep-82	380	75.04	1.6509	62,733
Oct-82	380	71.50	1.5730	59,774
Nov-82	380	74.16	1.6315	61,998
Dec-82	380	71.45	1.5719	59,732
Jan-83	380	73.01	1.6062	61,036
Feb-83	380	75.02	1.6504	62,717
Mar-83	380	76.21	1.6766	63,712
Apr-83	380	75.89	1.6696	63,444
May-83	380	73.44	1.6157	61,396
Jun-83	380	74.78	1.6452	62,516
Jul-83	380	74.84	1.6465	62,566
Aug-83	380	73.63	1.6199	61,555
Sep-83	380	70.01	1.5402	58,528
Oct-83	380	70.79	1.5574	59,180
Nov-83	380	70.25	1.5455	58,729
Dec-83	380	74.44	1.6377	62,232
Jan-84	380	77.59	1.7070	64,865
Feb-84	380	78.11	1.7184	65,300
Mar-84	380	77.08	1.6958	64,439
Apr-84	380	74.56	1.6403	62,332
May-84	380	72.81	1.6018	60,869
Jun-84	380	75.11	1.6524	62,792
Jul-84	380	76.27	1.6779	63,762
Aug-84	380	74.63	1.6419	62,391
Sep-84	380	74.55	1.6401	62,324
Oct-84	380	74.93	1.6485	62,641
Nov-84	380	74.64	1.6421	62,399
Dec-84	380	77.45	1.7039	64,748
Jan-85	380	78.00	1.7160	65,208
Feb-85	380	77.25	1.6995	64,581
Mar-85	380	77.95	1.7149	65,166
Apr-85	380	75.74	1.6663	63,319
May-85	380	76.19	1.6762	63,695
Jun-85	380	77.85	1.7127	65,083
Jul-85	380	73.31	1.6128	61,287
Aug-85	380	71.83	1.5803	60,050
Sep-85	380	73.70	1.6214	61,613
Oct-85	380	76.20	1.6764	63,703
Nov-85	380	77.24	1.6993	64,573
Dec-85	380	79.40	1.7468	66,378

APPENDIX T - PREDICTED FEED COSTS

NO. OF ANIMALS PURCHASED :	100
DEATH LOSS (% OF ANIMALS) :	0.4
% OF FEED CONSUMED BY THE NO OF ANIMALS THAT DIE :	25
NO. OF ANIMALS FED :	99.7
FEED CONVERSION --- MEAN (KG) :	7.102
S.D. (KG) :	0.33
VAR. (KG) :	0.1089
TOTAL GAIN PER ANIMAL (KG) :	140
TOTAL FEED REQ. (KG/LOT) :	99,130
S.D. IN FEED REQ. (KG/LOT) :	4,606
VAR. IN FEED REQ. (KG/LOT) :	21,216,525
FACTOR TRANSFORMING BARLEY PRICE TO TOTAL FEED PRICE :	1.082
BARLEY FREIGHT - 1988 ($/T) :	6.50
FEED PROCESSING - 1984 ($/T) :	11.05
% OF F.I.P.I. USED TO ADJUST BARLEY FREIGHT PRICE --- FUEL :	33
--- M.V. MAIN. :	67

This table provides a time series of predicted feed costs based on a mean level of feed consumption of a barley based ration. Feed prices are based on barley prices at the beginning of the feeding period.

MM/YR	PRED. TOT. FEED REQ. (KG)	BARLEY $/T	GRAIN TRANS $/T	FEED COST $/T	TOT. PRED. FEED COST $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOTAL FEED COST $/LOT
Oct-72	99,130	47.90	2.24	54.25	5,378	4.01	336	5,714
Nov-72	99,130	47.90	2.24	54.25	5,378	4.01	338	5,716
Dec-72	99,130	47.90	2.24	54.25	5,378	4.01	340	5,718
Jan-73	99,130	54.92	2.28	61.89	6,135	4.08	342	6,477
Feb-73	99,130	54.92	2.28	61.89	6,135	4.08	346	6,481
Mar-73	99,130	54.92	2.28	61.89	6,135	4.08	349	6,484
Apr-73	99,130	59.39	2.30	66.75	6,617	4.21	352	6,969
May-73	99,130	59.39	2.30	66.75	6,617	4.21	353	6,970
Jun-73	99,130	59.39	2.30	66.75	6,617	4.21	354	6,971
Jul-73	99,130	66.74	2.34	74.75	7,410	4.24	354	7,764
Aug-73	99,130	66.74	2.34	74.75	7,410	4.24	356	7,766
Sep-73	99,130	66.74	2.34	74.75	7,410	4.24	358	7,767
Oct-73	99,130	91.00	2.41	101.07	10,019	4.30	360	10,378
Nov-73	99,130	91.00	2.41	101.07	10,019	4.30	363	10,382
Dec-73	99,130	91.00	2.41	101.07	10,019	4.30	367	10,386
Jan-74	99,130	102.34	2.49	113.42	11,244	4.43	370	11,614
Feb-74	99,130	102.34	2.49	113.42	11,244	4.43	374	11,618
Mar-74	99,130	102.34	2.49	113.42	11,244	4.43	378	11,622
Apr-74	99,130	106.97	2.51	118.46	11,743	4.58	382	12,125
May-74	99,130	106.97	2.51	118.46	11,743	4.58	386	12,129
Jun-74	99,130	106.97	2.51	118.46	11,743	4.58	391	12,133
Jul-74	99,130	111.92	2.70	124.02	12,294	4.73	395	12,688
Aug-74	99,130	111.92	2.70	124.02	12,294	4.73	398	12,692
Sep-74	99,130	111.92	2.70	124.02	12,294	4.73	402	12,696
Oct-74	99,130	117.99	2.80	130.69	12,955	4.86	406	13,361
Nov-74	99,130	117.99	2.80	130.69	12,955	4.86	410	13,365
Dec-74	99,130	117.99	2.80	130.69	12,955	4.86	414	13,370
Jan-75	99,130	116.07	2.87	128.69	12,757	5.01	419	13,176
Feb-75	99,130	103.02	2.87	114.57	11,357	5.01	423	11,780
Mar-75	99,130	95.46	2.87	106.39	10,547	5.01	427	10,974
Apr-75	99,130	91.55	2.94	102.24	10,135	5.16	432	10,566
May-75	99,130	89.68	2.94	100.21	9,934	5.16	436	10,370
Jun-75	99,130	86.18	2.94	96.43	9,559	5.16	440	9,998
Jul-75	99,130	91.02	3.15	101.89	10,100	5.31	444	10,544
Aug-75	99,130	107.21	3.15	119.41	11,837	5.31	449	12,286
Sep-75	99,130	94.12	3.15	105.25	10,433	5.31	454	10,887
Oct-75	99,130	92.82	3.28	103.97	10,307	5.49	459	10,766
Nov-75	99,130	92.90	3.28	104.06	10,316	5.49	461	10,777
Dec-75	99,130	92.97	3.28	104.14	10,323	5.49	463	10,787
Jan-76	99,130	93.62	3.29	104.86	10,395	5.58	466	10,860
Feb-76	99,130	90.72	3.29	101.72	10,084	5.58	470	10,553
Mar-76	99,130	90.88	3.29	101.90	10,101	5.58	474	10,575
Apr-76	99,130	90.06	3.33	101.05	10,017	5.72	478	10,495
May-76	99,130	89.75	3.33	100.72	9,984	5.72	481	10,465
Jun-76	99,130	89.81	3.33	100.78	9,991	5.72	484	10,474
Jul-76	99,130	86.91	3.34	97.65	9,680	5.83	487	10,167
Aug-76	99,130	81.90	3.34	92.23	9,142	5.83	490	9,632
Sep-76	99,130	76.04	3.34	85.89	8,514	5.83	492	9,006
Oct-76	99,130	76.37	3.43	86.34	8,559	5.92	495	9,054
Nov-76	99,130	73.93	3.43	83.70	8,297	5.92	499	8,796
Dec-76	99,130	77.94	3.43	88.04	8,727	5.92	502	9,230

MM/YR	PRED. TOT. FEED REQ. (KG)	BARLEY $/T	GRAIN TRANS $/T	FEED COST $/T	TOT. PRED. FEED COST $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOTAL FEED COST $/LOT
Jan-77	99,130	79.95	3.49	90.29	8,950	6.05	506	9,456
Feb-77	99,130	80.36	3.49	90.73	8,994	6.05	507	9,501
Mar-77	99,130	79.99	3.49	90.33	8,954	6.05	509	9,463
Apr-77	99,130	81.45	3.57	92.00	9,120	6.11	511	9,630
May-77	99,130	83.72	3.57	94.45	9,363	6.11	515	9,878
Jun-77	99,130	78.01	3.57	88.27	8,751	6.11	518	9,269
Jul-77	99,130	69.75	3.61	79.38	7,869	6.24	522	8,391
Aug-77	99,130	60.94	3.61	69.84	6,924	6.24	526	7,449
Sep-77	99,130	61.77	3.61	70.74	7,013	6.24	529	7,542
Oct-77	99,130	60.54	3.69	69.49	6,889	6.36	532	7,421
Nov-77	99,130	62.34	3.69	71.44	7,082	6.36	537	7,619
Dec-77	99,130	61.72	3.69	70.77	7,015	6.36	542	7,558
Jan-78	99,130	64.31	3.73	73.62	7,298	6.55	547	7,845
Feb-78	99,130	64.34	3.73	73.65	7,301	6.55	547	7,848
Mar-78	99,130	65.50	3.73	74.91	7,426	6.55	547	7,973
Apr-78	99,130	66.36	3.67	75.77	7,511	6.55	547	8,058
May-78	99,130	65.39	3.67	74.72	7,407	6.55	549	7,956
Jun-78	99,130	60.65	3.67	69.60	6,899	6.55	551	7,450
Jul-78	99,130	57.18	3.70	65.87	6,530	6.62	553	7,083
Aug-78	99,130	55.03	3.70	63.55	6,299	6.62	559	6,858
Sep-78	99,130	54.71	3.70	63.20	6,265	6.62	564	6,830
Oct-78	99,130	58.18	3.80	67.06	6,647	6.84	571	7,218
Nov-78	99,130	57.84	3.80	66.69	6,611	6.84	578	7,189
Dec-78	99,130	57.62	3.80	66.45	6,587	6.84	585	7,172
Jan-79	99,130	58.95	3.93	68.03	6,744	7.10	593	7,336
Feb-79	99,130	61.52	3.93	70.81	7,020	7.10	596	7,616
Mar-79	99,130	61.81	3.93	71.13	7,051	7.10	600	7,651
Apr-79	99,130	66.37	3.99	76.13	7,547	7.24	604	8,151
May-79	99,130	69.80	3.99	79.84	7,915	7.24	607	8,521
Jun-79	99,130	74.83	3.99	85.28	8,454	7.24	609	9,063
Jul-79	99,130	74.38	4.05	84.86	8,412	7.34	612	9,024
Aug-79	99,130	81.49	4.05	92.56	9,175	7.34	616	9,791
Sep-79	99,130	87.89	4.05	99.48	9,862	7.34	621	10,483
Oct-79	99,130	90.03	4.26	102.02	10,113	7.53	626	10,739
Nov-79	99,130	94.70	4.26	107.07	10,614	7.53	631	11,245
Dec-79	99,130	96.05	4.26	108.53	10,759	7.53	636	11,395
Jan-80	99,130	100.03	4.41	113.00	11,202	7.71	641	11,843
Feb-80	99,130	93.30	4.41	105.72	10,480	7.71	645	11,125
Mar-80	99,130	93.19	4.41	105.60	10,469	7.71	649	11,118
Apr-80	99,130	93.95	4.68	106.72	10,579	7.85	654	11,233
May-80	99,130	100.46	4.68	113.77	11,278	7.85	658	11,935
Jun-80	99,130	109.50	4.68	123.55	12,247	7.85	662	12,909
Jul-80	99,130	119.21	4.81	134.19	13,302	7.98	666	13,968
Aug-80	99,130	116.68	4.81	131.45	13,031	7.98	676	13,706
Sep-80	99,130	118.75	4.81	133.69	13,253	7.98	685	13,938
Oct-80	99,130	122.32	5.06	137.82	13,662	8.35	694	14,356
Nov-80	99,130	132.13	5.06	148.44	14,715	8.35	704	15,419
Dec-80	99,130	132.95	5.06	149.33	14,803	8.35	715	15,518
Jan-81	99,130	130.69	5.26	147.09	14,581	8.75	727	15,308
Feb-81	99,130	128.37	5.26	144.58	14,333	8.75	732	15,064
Mar-81	99,130	129.07	5.26	145.34	14,408	8.75	736	15,144

MM/YR	PRED. TOT. FEED REQ. (KG)	BARLEY $/T	GRAIN TRANS. $/T	FEED COST $/T	TOT. PRED. FEED COST $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOTAL FEED COST $/LOT
Apr-81	99,130	131.50	5.50	148.24	14,694	8.93	740	15,435
May-81	99,130	132.19	5.50	148.98	14,769	8.93	750	15,519
Jun-81	99,130	123.76	5.50	139.86	13,864	8.93	760	14,625
Jul-81	99,130	123.53	5.73	139.86	13,864	9.31	771	14,635
Aug-81	99,130	117.61	5.73	133.45	13,229	9.31	781	14,010
Sep-81	99,130	103.44	5.73	118.12	11,709	9.31	791	12,501
Oct-81	99,130	104.77	6.00	119.86	11,881	9.64	801	12,682
Nov-81	99,130	102.29	6.00	117.17	11,615	9.64	806	12,421
Dec-81	99,130	104.06	6.00	119.09	11,805	9.64	810	12,616
Jan-82	99,130	108.33	6.04	123.75	12,267	9.80	815	13,082
Feb-82	99,130	108.75	6.04	124.20	12,312	9.80	822	13,133
Mar-82	99,130	103.27	6.04	118.27	11,724	9.80	828	12,553
Apr-82	99,130	106.55	6.27	122.07	12,100	10.05	835	12,935
May-82	99,130	108.66	6.27	124.35	12,327	10.05	834	13,161
Jun-82	99,130	106.75	6.27	122.28	12,122	10.05	833	12,955
Jul-82	99,130	97.90	6.24	112.68	11,170	10.01	833	12,003
Aug-82	99,130	88.43	6.24	102.44	10,155	10.01	836	10,991
Sep-82	99,130	81.09	6.24	94.50	9,367	10.01	839	10,207
Oct-82	99,130	77.40	6.40	90.67	8,989	10.11	843	9,831
Nov-82	99,130	85.83	6.40	99.80	9,893	10.11	847	10,739
Dec-82	99,130	87.21	6.40	101.29	10,041	10.11	851	10,891
Jan-83	99,130	86.84	6.27	100.75	9,987	10.24	855	10,842
Feb-83	99,130	84.08	6.27	97.76	9,691	10.24	860	10,551
Mar-83	99,130	81.76	6.27	95.25	9,442	10.24	866	10,308
Apr-83	99,130	80.26	6.51	93.88	9,306	10.45	872	10,178
May-83	99,130	80.79	6.51	94.45	9,363	10.45	875	10,238
Jun-83	99,130	77.08	6.51	90.44	8,965	10.45	877	9,843
Jul-83	99,130	73.86	6.50	86.95	8,620	10.55	880	9,500
Aug-83	99,130	86.60	6.50	100.74	9,986	10.55	884	10,870
Sep-83	99,130	94.33	6.50	109.10	10,815	10.55	887	11,702
Oct-83	99,130	104.74	6.52	120.39	11,934	10.67	890	12,824
Nov-83	99,130	105.13	6.52	120.81	11,976	10.67	895	12,871
Dec-83	99,130	105.41	6.52	121.11	12,006	10.67	900	12,906
Jan-84	99,130	105.94	6.62	121.79	12,073	10.84	904	12,977
Feb-84	99,130	101.72	6.62	117.22	11,620	10.84	907	12,527
Mar-84	99,130	106.71	6.62	122.62	12,155	10.84	909	13,064
Apr-84	99,130	107.47	6.53	123.35	12,227	10.93	911	13,139
May-84	99,130	114.35	6.53	130.79	12,965	10.93	914	13,879
Jun-84	99,130	112.35	6.53	128.63	12,751	10.93	917	13,668
Jul-84	99,130	101.44	6.59	116.89	11,588	11.05	921	12,508
Aug-84	99,130	105.43	6.59	121.21	12,015	11.05	923	12,939
Sep-84	99,130	105.39	6.59	121.17	12,011	11.05	926	12,937
Oct-84	99,130	107.37	6.69	123.41	12,234	11.12	928	13,162
Nov-84	99,130	112.57	6.69	129.04	12,792	11.12	930	13,722
Dec-84	99,130	115.55	6.69	132.26	13,111	11.12	931	14,043

MM/YR	PRED. TOT. FEED REQ. (KG)	BARLEY $/T	GRAIN TRANS $/T	FEED COST $/T	TOT. PRED. FEED COST $/LOT	FEED PRO. COST $/T	FEED PRO. COST $/LOT	TOTAL FEED COST $/LOT
Jan-85	99,130	115.22	6.79	132.02	13,087	11.18	933	14,019
Feb-85	99,130	114.84	6.79	131.61	13,046	11.18	934	13,980
Mar-85	99,130	115.98	6.79	132.84	13,168	11.18	936	14,104
Apr-85	99,130	119.22	6.74	136.29	13,510	11.22	937	14,448
May-85	99,130	115.82	6.74	132.61	13,146	11.22	936	14,082
Jun-85	99,130	110.14	6.74	126.47	12,537	11.22	935	13,471
Jul-85	99,130	108.66	6.76	124.89	12,380	11.18	934	13,313
Aug-85	99,130	98.83	6.76	114.25	11,326	11.18	941	12,266
Sep-85	99,130	94.01	6.76	109.03	9,039	11.18	945	9,984
Oct-85	N/A	94.14	6.80	109.21	N/A	11.23	N/A	N/A
Nov-85	N/A	93.43	6.80	108.45	N/A	11.23	N/A	N/A
Dec-85	N/A	92.79	6.80	107.75	N/A	11.23	N/A	N/A

* CBOP payment made beginning in September, 1985

** N/A means Not Applicable

APPENDIX U - PREDICTED YARDAGE COSTS

O --- STRAW USED (KG/HEAD/DAY) :	0.91
D --- PREDICTED ADG (KG/HEAD/DAY) :	1.48
E --- NO. OF ANIMALS FED :	99.7
INDEX PROPORTION FOR YARDAGE --- SUPPLIES & SERVICES (%) :	100
INDEX PROPORTION FOR BEDDING --- LEGUME & GRASS (%) :	100
TOTAL GAIN (KG) :	140
YARDAGE COST AS OF JULY, 1987 ($/HEAD/DAY) :	0.15
BEDDING COST ASOF JULY,1987 ($/HEAD/DAY) :	0.04

This table provides a time series of predicted yardage costs based on a mean level of ADG and daily yardage and bedding costs.

MM/YEAR	TOT. YARD. ($/LOT)	PRED ADG	YARDAGE $/HD/DAY	BEDDING $/HD/DAY
Oct-72	574	1.48	0.053	0.009
Nov-72	574	1.48	0.053	0.009
Dec-72	574	1.48	0.053	0.009
Jan-73	605	1.48	0.054	0.012
Feb-73	605	1.48	0.054	0.012
Mar-73	605	1.48	0.054	0.012
Apr-73	623	1.48	0.055	0.012
May-73	623	1.48	0.055	0.012
Jun-73	623	1.48	0.055	0.012
Jul-73	626	1.48	0.056	0.012
Aug-73	626	1.48	0.056	0.012
Sep-73	626	1.48	0.056	0.012
Oct-73	634	1.48	0.057	0.012
Nov-73	634	1.48	0.057	0.012
Dec-73	634	1.48	0.057	0.012
Jan-74	737	1.48	0.058	0.022
Feb-74	737	1.48	0.058	0.022
Mar-74	736	1.48	0.058	0.022
Apr-74	756	1.48	0.060	0.023
May-74	756	1.48	0.060	0.023
Jun-74	755	1.48	0.060	0.023
Jul-74	775	1.48	0.062	0.023
Aug-74	775	1.48	0.062	0.023
Sep-74	775	1.48	0.062	0.023
Oct-74	791	1.48	0.064	0.023
Nov-74	791	1.48	0.064	0.023
Dec-74	791	1.48	0.064	0.023
Jan-75	787	1.48	0.066	0.020
Feb-75	787	1.48	0.066	0.020
Mar-75	787	1.48	0.066	0.020
Apr-75	807	1.48	0.068	0.020
May-75	807	1.48	0.068	0.020
Jun-75	807	1.48	0.068	0.020
Jul-75	825	1.48	0.070	0.020
Aug-75	824	1.48	0.070	0.020
Sep-75	824	1.48	0.070	0.020
Oct-75	847	1.48	0.072	0.020
Nov-75	847	1.48	0.072	0.020
Dec-75	847	1.48	0.072	0.020
Jan-76	841	1.48	0.073	0.018
Feb-76	841	1.48	0.073	0.018
Mar-76	841	1.48	0.073	0.018
Apr-76	858	1.48	0.075	0.018
May-76	858	1.48	0.075	0.018
Jun-76	858	1.48	0.075	0.018
Jul-76	872	1.48	0.077	0.018
Aug-76	872	1.48	0.077	0.018
Sep-76	872	1.48	0.077	0.018
Oct-76	883	1.48	0.078	0.018
Nov-76	884	1.48	0.078	0.018
Dec-76	884	1.48	0.078	0.018

MM/YEAR	TOT. YARD. ($/LOT)	PRED ADG	YARDAGE $/HD/DAY	BEDDING $/HD/DAY
Jan-77	965	1.48	0.080	0.026
Feb-77	965	1.48	0.080	0.026
Mar-77	965	1.48	0.080	0.026
Apr-77	973	1.48	0.080	0.026
May-77	973	1.48	0.080	0.026
Jun-77	973	1.48	0.080	0.026
Jul-77	990	1.48	0.082	0.026
Aug-77	990	1.48	0.082	0.026
Sep-77	990	1.48	0.082	0.026
Oct-77	1,004	1.48	0.084	0.026
Nov-77	1,004	1.48	0.084	0.026
Dec-77	1,004	1.48	0.084	0.026
Jan-78	1,026	1.48	0.086	0.026
Feb-78	1,026	1.48	0.086	0.026
Mar-78	1,026	1.48	0.086	0.026
Apr-78	1,026	1.48	0.086	0.026
May-78	1,026	1.48	0.086	0.026
Jun-78	1,026	1.48	0.086	0.026
Jul-78	1,034	1.48	0.087	0.026
Aug-78	1,034	1.48	0.087	0.026
Sep-78	1,033	1.48	0.087	0.026
Oct-78	1,060	1.48	0.090	0.026
Nov-78	1,060	1.48	0.090	0.026
Dec-78	1,060	1.48	0.090	0.026
Jan-79	1,101	1.48	0.094	0.027
Feb-79	1,101	1.48	0.094	0.027
Mar-79	1,101	1.48	0.094	0.027
Apr-79	1,118	1.48	0.095	0.027
May-79	1,118	1.48	0.095	0.027
Jun-79	1,118	1.48	0.095	0.027
Jul-79	1,130	1.48	0.097	0.027
Aug-79	1,129	1.48	0.097	0.027
Sep-79	1,128	1.48	0.097	0.027
Oct-79	1,150	1.48	0.099	0.027
Nov-79	1,150	1.48	0.099	0.027
Dec-79	1,150	1.48	0.099	0.027
Jan-80	1,179	1.48	0.102	0.028
Feb-80	1,178	1.48	0.102	0.028
Mar-80	1,179	1.48	0.102	0.028
Apr-80	1,195	1.48	0.103	0.027
May-80	1,196	1.48	0.103	0.027
Jun-80	1,196	1.48	0.103	0.027
Jul-80	1,213	1.48	0.105	0.027
Aug-80	1,212	1.48	0.105	0.027
Sep-80	1,212	1.48	0.105	0.027
Oct-80	1,256	1.48	0.110	0.027
Nov-80	1,254	1.48	0.110	0.027
Dec-80	1,254	1.48	0.110	0.027
Jan-81	1,309	1.48	0.115	0.028
Feb-81	1,309	1.48	0.115	0.028
Mar-81	1,308	1.48	0.115	0.028
Apr-81	1,329	1.48	0.118	0.028
May-81	1,329	1.48	0.118	0.028
Jun-81	1,327	1.48	0.118	0.028

MM/YEAR	TOT. YARD. (\$/LOT)	PRED ADG	YARDAGE \$/HD/DAY	BEDDING \$/HD/DAY
Jul-81	1,375	1.48	0.123	0.028
Aug-81	1,376	1.48	0.123	0.028
Sep-81	1,378	1.48	0.123	0.028
Oct-81	1,422	1.48	0.127	0.029
Nov-81	1,423	1.48	0.127	0.029
Dec-81	1,423	1.48	0.127	0.029
Jan-82	1,396	1.48	0.129	0.023
Feb-82	1,396	1.48	0.129	0.023
Mar-82	1,396	1.48	0.129	0.023
Apr-82	1,415	1.48	0.132	0.022
May-82	1,415	1.48	0.132	0.022
Jun-82	1,416	1.48	0.132	0.022
Jul-82	1,412	1.48	0.132	0.022
Aug-82	1,413	1.48	0.132	0.022
Sep-82	1,414	1.48	0.132	0.022
Oct-82	1,440	1.48	0.133	0.023
Nov-82	1,440	1.48	0.133	0.023
Dec-82	1,441	1.48	0.133	0.023
Jan-83	1,491	1.48	0.135	0.027
Feb-83	1,492	1.48	0.135	0.027
Mar-83	1,492	1.48	0.135	0.027
Apr-83	1,529	1.48	0.138	0.029
May-83	1,529	1.48	0.138	0.029
Jun-83	1,529	1.48	0.138	0.029
Jul-83	1,541	1.48	0.139	0.029
Aug-83	1,541	1.48	0.139	0.029
Sep-83	1,541	1.48	0.139	0.029
Oct-83	1,546	1.48	0.140	0.027
Nov-83	1,546	1.48	0.140	0.027
Dec-83	1,546	1.48	0.140	0.027
Jan-84	1,571	1.48	0.143	0.028
Feb-84	1,570	1.48	0.143	0.028
Mar-84	1,570	1.48	0.143	0.028
Apr-84	1,579	1.48	0.144	0.028
May-84	1,578	1.48	0.144	0.028
Jun-84	1,578	1.48	0.144	0.028
Jul-84	1,593	1.48	0.146	0.028
Aug-84	1,593	1.48	0.146	0.028
Sep-84	1,594	1.48	0.146	0.028
Oct-84	1,604	1.48	0.147	0.028
Nov-84	1,605	1.48	0.147	0.028
Dec-84	1,604	1.48	0.147	0.028
Jan-85	1,612	1.48	0.147	0.028
Feb-85	1,613	1.48	0.147	0.028
Mar-85	1,614	1.48	0.147	0.028
Apr-85	1,614	1.48	0.148	0.027
May-85	1,614	1.48	0.148	0.027
Jun-85	1,614	1.48	0.148	0.027
Jul-85	1,609	1.48	0.147	0.027
Aug-85	1,618	1.48	0.147	0.027
Sep-85	1,622	1.48	0.147	0.027
Oct-85	N/A	N/A	0.148	0.029
Nov-85	N/A	N/A	0.148	0.029
Dec-85	N/A	N/A	0.148	0.029

* N/A means NOT APPLICABLE

APPENDIX V - PREDICTED TREATMENT COSTS

Zo --- NO. OF ANIMALS TREATED : 100
I.T.P. PREMIUM RATE (%) : 1

This table provides a time series of predicted treatment costs based on a mean level of treatment costs per animal and an ITP premium which is known at the beginning of the feeding period.

MM/YR	TOT. TRTMT. COST $/LOT	TRTMT. COST PER ANIMAL ($)	I.T.P. PREMIUM $/LOT
Oct-72	751	4.25	326
Nov-72	753	4.25	328
Dec-72	769	4.25	344
Jan-73	762	4.33	329
Feb-73	781	4.33	348
Mar-73	795	4.33	362
Apr-73	798	4.46	351
May-73	799	4.46	352
Jun-73	827	4.46	381
Jul-73	842	4.49	392
Aug-73	887	4.49	437
Sep-73	881	4.49	432
Oct-73	876	4.56	419
Nov-73	864	4.56	408
Dec-73	838	4.56	382
Jan-74	885	4.70	416
Feb-74	875	4.70	405
Mar-74	837	4.70	367
Apr-74	855	4.85	370
May-74	860	4.85	375
Jun-74	832	4.85	347
Jul-74	865	5.02	364
Aug-74	836	5.02	334
Sep-74	813	5.02	311
Oct-74	816	5.15	301
Nov-74	840	5.15	325
Dec-74	853	5.15	337
Jan-75	839	5.31	308
Feb-75	813	5.31	282
Mar-75	824	5.31	294
Apr-75	841	5.47	294
May-75	880	5.47	333
Jun-75	889	5.47	342
Jul-75	900	5.63	337
Aug-75	869	5.63	306
Sep-75	855	5.63	292
Oct-75	891	5.82	309
Nov-75	875	5.82	293
Dec-75	885	5.82	303
Jan-76	882	5.91	291
Feb-76	900	5.91	309
Mar-76	905	5.91	314
Apr-76	939	6.07	332
May-76	940	6.07	334
Jun-76	931	6.07	325
Jul-76	923	6.18	304
Aug-76	911	6.18	293
Sep-76	917	6.18	299
Oct-76	902	6.28	274
Nov-76	897	6.28	269
Dec-76	898	6.28	270

MM/YR	TOT. TRTMT. COST $/LOT	TRTMT. COST PER ANIMAL ($)	I.T.P. PREMIUM $/LOT
Jan-77	916	6.42	274
Feb-77	930	6.42	288
Mar-77	940	6.42	298
Apr-77	955	6.47	307
May-77	960	6.47	313
Jun-77	969	6.47	322
Jul-77	987	6.62	325
Aug-77	991	6.62	329
Sep-77	998	6.62	336
Oct-77	1,010	6.75	335
Nov-77	1,024	6.75	350
Dec-77	1,020	6.75	345
Jan-78	1,063	6.94	369
Feb-78	1,085	6.94	391
Mar-78	1,121	6.94	427
Apr-78	1,164	6.94	470
May-78	1,229	6.94	535
Jun-78	1,269	6.94	575
Jul-78	1,275	7.02	574
Aug-78	1,280	7.02	579
Sep-78	1,293	7.02	592
Oct-78	1,324	7.25	599
Nov-78	1,306	7.25	581
Dec-78	1,331	7.25	606
Jan-79	1,420	7.53	667
Feb-79	1,493	7.53	740
Mar-79	1,545	7.53	792
Apr-79	1,533	7.68	765
May-79	1,515	7.68	748
Jun-79	1,499	7.68	731
Jul-79	1,480	7.78	702
Aug-79	1,458	7.78	679
Sep-79	1,506	7.78	727
Oct-79	1,457	7.98	659
Nov-79	1,452	7.98	654
Dec-79	1,493	7.98	695
Jan-80	1,536	8.17	719
Feb-80	1,531	8.17	714
Mar-80	1,492	8.17	674
Apr-80	1,442	8.32	610
May-80	1,428	8.32	596
Jun-80	1,416	8.32	584
Jul-80	1,474	8.46	627
Aug-80	1,496	8.46	650
Sep-80	1,495	8.46	649
Oct-80	1,536	8.85	651
Nov-80	1,551	8.85	665
Dec-80	1,558	8.85	673
Jan-81	1,600	9.28	672
Feb-81	1,572	9.28	644
Mar-81	1,564	9.28	636
Apr-81	1,587	9.46	641
May-81	1,569	9.46	623
Jun-81	1,573	9.46	627

MM/YR	TOT. TRTMT. COST $/LOT	TRTMT. COST PER ANIMAL ($)	I.T.P. PREMIUM $/LOT
Jul-81	1,621	9.87	634
Aug-81	1,603	9.87	616
Sep-81	1,592	9.87	605
Oct-81	1,612	10.22	590
Nov-81	1,587	10.22	565
Dec-81	1,595	10.22	573
Jan-82	1,564	10.40	525
Feb-82	1,596	10.40	557
Mar-82	1,609	10.40	570
Apr-82	1,651	10.66	585
May-82	1,676	10.66	610
Jun-82	1,702	10.66	636
Jul-82	1,688	10.61	628
Aug-82	1,697	10.61	636
Sep-82	1,688	10.61	627
Oct-82	1,669	10.72	598
Nov-82	1,692	10.72	620
Dec-82	1,669	10.72	597
Jan-83	1,696	10.86	610
Feb-83	1,713	10.86	627
Mar-83	1,723	10.86	637
Apr-83	1,742	11.07	634
May-83	1,721	11.07	614
Jun-83	1,733	11.07	625
Jul-83	1,744	11.18	626
Aug-83	1,734	11.18	616
Sep-83	1,703	11.18	585
Oct-83	1,723	11.31	592
Nov-83	1,718	11.31	587
Dec-83	1,753	11.31	622
Jan-84	1,798	11.49	649
Feb-84	1,802	11.49	653
Mar-84	1,794	11.49	644
Apr-84	1,782	11.59	623
May-84	1,768	11.59	609
Jun-84	1,787	11.59	628
Jul-84	1,809	11.72	638
Aug-84	1,795	11.72	624
Sep-84	1,795	11.72	623
Oct-84	1,806	11.79	626
Nov-84	1,803	11.79	624
Dec-84	1,827	11.79	647
Jan-85	1,837	11.85	652
Feb-85	1,831	11.85	646
Mar-85	1,837	11.85	652
Apr-85	1,823	11.90	633
May-85	1,827	11.90	637
Jun-85	1,841	11.90	651
Jul-85	1,798	11.85	613
Aug-85	1,786	11.85	600
Sep-85	1,801	11.85	616

APPENDIX W - PREDICTED PROCESSING COSTS

Zo --- NO. OF ANIMALS PURCHASED :	100
Pp --- PROC. COSTS PER HEAD ($/HD) :	2.75

This table provides a time series of predicted processing costs for cattle entering the feedlot. Since these costs are assumed to be known at the beginning of the feeding period they are the same as realized costs.

MM/YR	TOT. PRED COST PROC. ($/LOT)	PREDICTED PROC. COST ($/HD)
Oct-72	95	0.9499
Nov-72	95	0.9499
Dec-72	95	0.9499
Jan-73	97	0.9673
Feb-73	97	0.9673
Mar-73	97	0.9673
Apr-73	100	0.9976
May-73	100	0.9976
Jun-73	100	0.9976
Jul-73	100	1.0041
Aug-73	100	1.0041
Sep-73	100	1.0041
Oct-73	102	1.0193
Nov-73	102	1.0193
Dec-73	102	1.0193
Jan-74	105	1.0497
Feb-74	105	1.0497
Mar-74	105	1.0497
Apr-74	108	1.0844
May-74	108	1.0844
Jun-74	108	1.0844
Jul-74	112	1.1213
Aug-74	112	1.1213
Sep-74	112	1.1213
Oct-74	115	1.1516
Nov-74	115	1.1516
Dec-74	115	1.1516
Jan-75	119	1.1863
Feb-75	119	1.1863
Mar-75	119	1.1863
Apr-75	122	1.2232
May-75	122	1.2232
Jun-75	122	1.2232
Jul-75	126	1.2579
Aug-75	126	1.2579
Sep-75	126	1.2579
Oct-75	130	1.3013
Nov-75	130	1.3013
Dec-75	130	1.3013
Jan-76	132	1.3208
Feb-76	132	1.3208
Mar-76	132	1.3208
Apr-76	136	1.3555
May-76	136	1.3555
Jun-76	136	1.3555
Jul-76	138	1.3815
Aug-76	138	1.3815
Sep-76	138	1.3815
Oct-76	140	1.4032
Nov-76	140	1.4032
Dec-76	140	1.4032

MM/YR	TOT. PRED COST PROC. ($/LOT)	PREDICTED PROC. COST ($/HD)
Jan-77	143	1.4336
Feb-77	143	1.4336
Mar-77	143	1.4336
Apr-77	145	1.4466
May-77	145	1.4466
Jun-77	145	1.4466
Jul-77	148	1.4791
Aug-77	148	1.4791
Sep-77	148	1.4791
Oct-77	151	1.5073
Nov-77	151	1.5073
Dec-77	151	1.5073
Jan-78	155	1.5507
Feb-78	155	1.5507
Mar-78	155	1.5507
Apr-78	155	1.5507
May-78	155	1.5507
Jun-78	155	1.5507
Jul-78	157	1.5680
Aug-78	157	1.5680
Sep-78	157	1.5680
Oct-78	162	1.6201
Nov-78	162	1.6201
Dec-78	162	1.6201
Jan-79	168	1.6830
Feb-79	168	1.6830
Mar-79	168	1.6830
Apr-79	172	1.7155
May-79	172	1.7155
Jun-79	172	1.7155
Jul-79	174	1.7394
Aug-79	174	1.7394
Sep-79	174	1.7394
Oct-79	178	1.7827
Nov-79	178	1.7827
Dec-79	178	1.7827
Jan-80	183	1.8261
Feb-80	183	1.8261
Mar-80	183	1.8261
Apr-80	186	1.8586
May-80	186	1.8586
Jun-80	186	1.8586
Jul-80	189	1.8912
Aug-80	189	1.8912
Sep-80	189	1.8912
Oct-80	198	1.9779
Nov-80	198	1.9779
Dec-80	198	1.9779
Jan-81	207	2.0733
Feb-81	207	2.0733
Mar-81	207	2.0733
Apr-81	211	2.1146
May-81	211	2.1146
Jun-81	211	2.1146

MM/YR	TOT. PRED COST PROC. ($/LOT)	PREDICTED PROC. COST ($/HD)
Jul-81	221	2.2056
Aug-81	221	2.2056
Sep-81	221	2.2056
Oct-81	228	2.2837
Nov-81	228	2.2837
Dec-81	228	2.2837
Jan-82	232	2.3228
Feb-82	232	2.3228
Mar-82	232	2.3228
Apr-82	238	2.3813
May-82	238	2.3813
Jun-82	238	2.3813
Jul-82	237	2.3705
Aug-82	237	2.3705
Sep-82	237	2.3705
Oct-82	239	2.3943
Nov-82	239	2.3943
Dec-82	239	2.3943
Jan-83	243	2.4269
Feb-83	243	2.4269
Mar-83	243	2.4269
Apr-83	247	2.4746
May-83	247	2.4746
Jun-83	247	2.4746
Jul-83	250	2.4984
Aug-83	250	2.4984
Sep-83	250	2.4984
Oct-83	253	2.5266
Nov-83	253	2.5266
Dec-83	253	2.5266
Jan-84	257	2.5678
Feb-84	257	2.5678
Mar-84	257	2.5678
Apr-84	259	2.5895
May-84	259	2.5895
Jun-84	259	2.5895
Jul-84	262	2.6177
Aug-84	262	2.6177
Sep-84	262	2.6177
Oct-84	264	2.6351
Nov-84	264	2.6351
Dec-84	264	2.6351
Jan-85	265	2.6481
Feb-85	265	2.6481
Mar-85	265	2.6481
Apr-85	266	2.6589
May-85	266	2.6589
Jun-85	266	2.6589
Jul-85	265	2.6481
Aug-85	265	2.6481
Sep-85	265	2.6481

APPENDIX X - PREDICTED MARKETING COSTS

COST OF HAULING PURCHASES - 1987 ($/LOT) :	1050
BUYER'S COMMISSION - 1987 ($/HEAD) :	5.00
NO. OF ANIMALS PURCHASED :	100
PURCHASE WEIGHT PER HEAD (KG) :	380
Wt --- WT. OF ANIMALS PURCHASED (KG/LOT) :	38,000
% OF F.I.P.I. IN TRUCKING -- FUEL :	33
-- M.V. MAIN. :	67

This table provides a time series of predicted marketing costs. Since these costs are associated with animal purchases all costs are known at the beginning of the feeding period and are the same as realized costs.

MM/YR	BUYER'S COMM. $/LOT	HAULING PURCH. $/LOT	PRED TOT. MKT. COSTS $/LOT
Oct-72	176	368	544
Nov-72	176	368	544
Dec-72	176	368	544
Jan-73	179	374	553
Feb-73	179	374	553
Mar-73	179	374	553
Apr-73	185	377	562
May-73	185	377	562
Jun-73	185	377	562
Jul-73	186	385	571
Aug-73	186	385	571
Sep-73	186	385	571
Oct-73	189	395	583
Nov-73	189	395	583
Dec-73	189	395	583
Jan-74	195	408	603
Feb-74	195	408	603
Mar-74	195	408	603
Apr-74	201	412	613
May-74	201	412	613
Jun-74	201	412	613
Jul-74	208	443	650
Aug-74	208	443	650
Sep-74	208	443	650
Oct-74	213	459	673
Nov-74	213	459	673
Dec-74	213	459	673
Jan-75	220	471	690
Feb-75	220	471	690
Mar-75	220	471	690
Apr-75	227	482	709
May-75	227	482	709
Jun-75	227	482	709
Jul-75	233	517	750
Aug-75	233	517	750
Sep-75	233	517	750
Oct-75	241	537	778
Nov-75	241	537	778
Dec-75	241	537	778
Jan-76	245	540	785
Feb-76	245	540	785
Mar-76	245	540	785
Apr-76	251	547	798
May-76	251	547	798
Jun-76	251	547	798
Jul-76	256	548	804
Aug-76	256	548	804
Sep-76	256	548	804
Oct-76	260	562	822
Nov-76	260	562	822
Dec-76	260	562	822

MM/YR	BUYER'S COMM. $/LOT	HAULING PURCH. $/LOT	PRED TOT. MKT. COSTS $/LOT
Jan-77	266	573	839
Feb-77	266	573	839
Mar-77	266	573	839
Apr-77	268	586	854
May-77	268	586	854
Jun-77	268	586	854
Jul-77	274	593	867
Aug-77	274	593	867
Sep-77	274	593	867
Oct-77	279	605	884
Nov-77	279	605	884
Dec-77	279	605	884
Jan-78	287	612	900
Feb-78	287	612	900
Mar-78	287	612	900
Apr-78	287	602	890
May-78	287	602	890
Jun-78	287	602	890
Jul-78	291	607	898
Aug-78	291	607	898
Sep-78	291	607	898
Oct-78	300	623	923
Nov-78	300	623	923
Dec-78	300	623	923
Jan-79	312	644	956
Feb-79	312	644	956
Mar-79	312	644	956
Apr-79	318	655	972
May-79	318	655	972
Jun-79	318	655	972
Jul-79	322	665	987
Aug-79	322	665	987
Sep-79	322	665	987
Oct-79	330	698	1,029
Nov-79	330	698	1,029
Dec-79	330	698	1,029
Jan-80	338	723	1,062
Feb-80	338	723	1,062
Mar-80	338	723	1,062
Apr-80	344	768	1,113
May-80	344	768	1,113
Jun-80	344	768	1,113
Jul-80	350	789	1,140
Aug-80	350	789	1,140
Sep-80	350	789	1,140
Oct-80	367	830	1,196
Nov-80	367	830	1,196
Dec-80	367	830	1,196
Jan-81	384	863	1,247
Feb-81	384	863	1,247
Mar-81	384	863	1,247
Apr-81	392	903	1,295
May-81	392	903	1,295
Jun-81	392	903	1,295

MM/YR	BUYER'S COMM. $/LOT	HAULING PURCH. $/LOT	PRED TOT. MKT. COSTS $/LOT
Jul-81	409	940	1,349
Aug-81	409	940	1,349
Sep-81	409	940	1,349
Oct-81	423	985	1,408
Nov-81	423	985	1,408
Dec-81	423	985	1,408
Jan-82	430	991	1,421
Feb-82	430	991	1,421
Mar-82	430	991	1,421
Apr-82	441	1,028	1,470
May-82	441	1,028	1,470
Jun-82	441	1,028	1,470
Jul-82	439	1,025	1,464
Aug-82	439	1,025	1,464
Sep-82	439	1,025	1,464
Oct-82	444	1,051	1,495
Nov-82	444	1,051	1,495
Dec-82	444	1,051	1,495
Jan-83	450	1,029	1,479
Feb-83	450	1,029	1,479
Mar-83	450	1,029	1,479
Apr-83	459	1,068	1,526
May-83	459	1,068	1,526
Jun-83	459	1,068	1,526
Jul-83	463	1,067	1,530
Aug-83	463	1,067	1,530
Sep-83	463	1,067	1,530
Oct-83	468	1,070	1,539
Nov-83	468	1,070	1,539
Dec-83	468	1,070	1,539
Jan-84	476	1,086	1,562
Feb-84	476	1,086	1,562
Mar-84	476	1,086	1,562
Apr-84	480	1,071	1,551
May-84	480	1,071	1,551
Jun-84	480	1,071	1,551
Jul-84	485	1,082	1,567
Aug-84	485	1,082	1,567
Sep-84	485	1,082	1,567
Oct-84	488	1,098	1,586
Nov-84	488	1,098	1,586
Dec-84	488	1,098	1,586
Jan-85	491	1,115	1,606
Feb-85	491	1,115	1,606
Mar-85	491	1,115	1,606
Apr-85	493	1,107	1,599
May-85	493	1,107	1,599
Jun-85	493	1,107	1,599
Jul-85	491	1,110	1,600
Aug-85	491	1,110	1,600
Sep-85	491	1,110	1,600